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WOUND INFECTION

Edited by W. H. OGILVIE

Contributors: G. A. H. BUTTLE, M.R.C.S., ROBERT CRUICKSHANK, M.D., LAWRENCE P. GARROD, M.D., W. H. OGILVIE, M.Ch., and L. E. H. WHITBY, *C.V.O.*, M.D.

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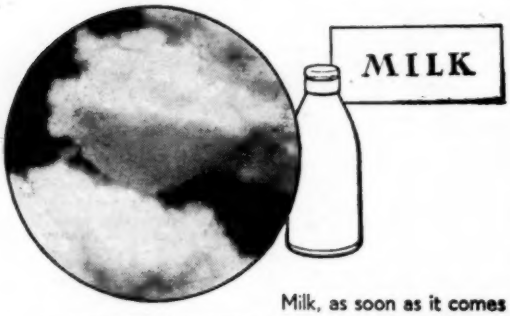

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ORIGINAL ARTICLES

QUANTITATIVE ASPECTS OF TRANSFUSION

BY

G. A. HARRISON, M.D. CAMB.
CHEMICAL PATHOLOGIST TO ST. BARTHOLOMEW'S HOSPITAL, LONDON

L. E. R. PICKEN, PH.D. CAMB.
LATELY BALFOUR STUDENT IN THE UNIVERSITY OF CAMBRIDGE

(From the Regional Blood Transfusion Laboratory, Cambridge)

Now that the regional services provide for the transfusion of serum, plasma and whole blood on a scale hitherto impossible it is well to consider to what extent these media are quantitatively equivalent. To neglect the quantitative aspects of transfusion is to risk discrediting a valuable aid to resuscitation, since there is grave danger of its abuse. It must be clearly recognised that the object of transfusion in cases of hæmorrhage and circulatory shock is to restore a balance, conditional for the normal functioning of all organ systems of the body, and not to stimulate impaired function by a therapeutic agent in the limited sense. To decide what volume can safely be transfused it is necessary to consider the dissolved protein content of the medium as well as the blood-volume of the subject, both in health and at the time of transfusion. That the simple quantitative considerations set out here have for the most part been neglected, sometimes to the patient's detriment, is clear from reports which have reached us and from current literature.

TRANSFUSION FOR HÆMORRHAGE AND WOUND SHOCK

Since a lasting restoration of the volume of circulating fluid to its normal value is the aim of transfusion for hæmorrhage or circulatory shock it is necessary to bear in mind what this normal value is. For each stone of body-weight there is, in health, approximately 1 pint of blood, so that if the body-weight is 10 st. the blood-volume is about 10 pints. In health, the proportion of corpuscles in the blood varies between 36 and 51% by volume: a convenient figure is 50%. It follows, therefore, that of a blood-volume of 10 pints approximately 5 pints are cells and 5 plasma (4·5 pints of cells and 5·5 pints of plasma would approximate more closely to the average figures).

Although the red cells are responsible for oxygen transport, their number may be lowered considerably (or raised appreciably) without endangering life; the rate of fall, however, is of moment. Thus it is well recognised that the red cells may fall to 20% of the normal value in pernicious anæmia—there may be only a pint of red cells in such a patient's body—but this level has been reached slowly. In an acute hæmorrhage, death would result before the volume of red cells could be reduced to this level; but life can be maintained after a sudden fall from 5 pints to 3, and possibly even to 2, pints of red cells. During hæmorrhage the volumes of red cells and plasma are reduced initially together, but it is the fall in the volume of plasma which produces the immediate signs and symptoms of circulatory or "secondary" shock. The chief constituents of plasma are water (over 90%), proteins (about 7%) and salts (less than 1%); the first and last are easily replaced but in the absence of the second their contribution to the volume of the circulating fluid is short-lived, since they rapidly leave the circulation. The proteins can only be replaced by the transfusion of serum, plasma or whole blood. The approximate concentrations of proteins in various transfusion media are as follows:

Transfusion medium	*Percentage of dissolved protein*
Filtered serum	7
Citrated plasma (120 c.cm. 2·5% sodium citrate, 420 c.cm. blood; or 120 c.cm. citrate and 220 c.cm. plasma)	4·5
Citrated whole blood (120 c.cm. citrate, 220 c.cm. plasma, 200 c.cm. cells)	3
Defibrinated whole blood (45 c.cm. cells, 55 c.cm. serum.)	3·7

Allowing 40 c.cm. for clearing air from the giving set and as waste in the bottle and tubing, each standard transfusion bottle should yield about 500 c.cm. of fluid to the patient, if filled originally to the 540 c.cm. mark. The weights of dissolved protein administered in one bottle of each of these transfusion media are shown below.

Transfusion medium	*Dissolved protein per 500 c.cm. bottle** (*g.*)
Filtered serum	35
Citrated plasma	23
Citrated whole blood	15
Defibrinated whole blood	18

* In the case of defibrinated blood, one bottle filled to the 540 c.cm. mark yields about 480 c.cm. blood to the patient after defibrination with 30 c.cm. glass beads, the fibrin clot remaining in the inverted bottle on top of the beads (Harrison and Picken, *Lancet*, March 22, 1941, p. 405).

An acute hæmorrhage would be very severe if the patient lost 3 pints of cells and 3 pints of plasma. Taking this as an extreme case, 3 pints—that is, 1700 c.cm.—of undiluted plasma contain 119 g. of plasma proteins; this can be replaced as shown below.

Transfusion medium	*Pints (bottles) to yield 119 g. dissolved protein*
Filtered serum	3·4
Citrated plasma	5·1
Citrated whole blood	8
Defibrinated whole blood	6·6

These, therefore, are maximum values for the volume of fluid to be transfused in cases of severe hæmorrhage; they should rarely, if ever, be exceeded. In most cases a much smaller volume will be ample.

Plasma may, however, be lost from the circulation both internally as well as externally. It will, of course, escape together with red cells if the hæmorrhage is internal, but it may also pass into injured, lacerated or crushed tissues. It is difficult to assess the magnitude of this loss from the degree of swelling in the injured area, but in most cases one bottle of serum or citrated plasma or two bottles of whole blood will probably balance, or more than balance, this loss. We suggest that in cases of wound shock with hæmorrhage one bottle of filtered serum or plasma should be transfused quickly in 10–15 min.; this would make good a loss of approximately 2 pints of blood. If there is evidence of a much larger hæmorrhage, a second bottle should be given more slowly. But few patients will need more, and in no case should more than four bottles of serum, or their equivalent, be administered initially. If external hæmorrhage continues the loss should be estimated and the patient transfused accordingly.

After the initial treatment for shock, whole blood should be used for the subsequent treatment of anæmia, the volume to be transfused being estimated from the results of hæmoglobin determinations. In wound shock without significant hæmorrhage one, or at most two, bottles of serum or their equivalent of plasma should be given.

DANGERS OF TRANSFUSION

Accepting these figures, it may be asked whether any harm, over and above wastage of protein-containing fluids, can result from the administration of serum, plasma or whole blood to patients suffering from "primary" shock only, or in a simple prolonged faint, or in hysteria. The answer depends on the nature and amount of the fluid transfused, and above all on the condition of the subject's heart. Simple arithmetic may help again. Suppose the subject weighs 10 st. (63·5 kg.). The plasma-volume in health is kept steady at about 5% of the body-weight (50 c.cm. per kg.) and is substantially unaltered by a large number of diseases, even when there are gross variations in the percentage of cells. The

Transfusion medium	*Dissolved protein per bottle* (*g.*)	*Increase in circulating protein* (%)
Filtered serum	35	16
Citrated plasma	23	10
Citrated blood	15	7
Defibrinated blood	18	8

subject, therefore, has 50 × 63·5, or 3175 c.cm., of plasma, containing about 222 g. of proteins. The percentage increase in the plasma proteins after the transfusion of one bottle of fluid is shown above.

Obviously it is the use of serum which calls for most care. Once introduced, plasma protein cannot readily leave the circulation, and by virtue of its osmotic pressure retains the water injected with it; this means extra work for the heart. The lungs act as the immediate safety valve, and if the volume of plasma protein solution in circulation exceeds a certain level fluid rapidly passes into the pulmonary alveoli, causing œdema of the lungs. We cannot say what percentage increase of protein in the plasma will cause a dangerous degree of pulmonary œdema, but probably even one bottle of serum may be deleterious. There can be little doubt that in severe secondary shock one bottle in excess of the amount required to replace lost plasma may endanger life. In patients suffering from "primary" shock only, where there is no evidence of loss of cells or plasma from the circulation either by internal hæmorrhage or œdema, it cannot be too strongly emphasised that there is no rational basis for treatment by transfusion.

CONTROL OF DOSAGE

Ideally, dosage would be regulated by repeated determinations of plasma-volume or blood-volume, but unfortunately really simple methods for estimating these do not exist. The urgent need for transfusion often precludes the use even of such methods as are available. Of these, one of the best is that of Hill [1] for determining the blood-volume during transfusions of whole blood; as Hill suggests, the same principle might be used in assessing the plasma-volume during serum transfusions. In the absence of such precise information, other and less reliable indications have to be considered. No single test is a sure guide: pulse-rate, hæmoglobin percentage, red-cell count and hæmatocrit determinations are of value, but their interpretation is at times very difficult. A mental estimate of the amount of plasma and red cells which may have left the circulation is useful, but may be difficult to make. Even the immediate response of the blood-pressure to transfusion affords no certain indication either that enough fluid has been or that more should be administered. Early in "primary" shock the blood-pressure may be subnormal—a factor making differentiation from circulatory shock difficult. If no time is allowed for observation of such a patient, and a transfusion is given at once, the subsequent rise in blood-pressure may wrongly be ascribed to satisfactory treatment of circulatory shock. Conversely, even if the blood-pressure fails to respond favourably, transfusion should be discontinued once the volume permissible on the grounds discussed here has been administered.

While it is difficult, then, to assess dosage on the basis of any or all of these various signs, we shall probably avoid transfusing an excessive amount if we administer, of any medium, only sufficient to make good the maximum probable protein loss from the circulation.

SUMMARY

In cases of hæmorrhage or circulatory shock, the lasting restoration of the blood-volume to its normal value by transfusion depends on the replacement of dissolved protein lost from the circulation as a result of injury.

Since equal volumes of serum, citrated plasma, citrated whole blood and defibrinated whole blood contain different amounts of dissolved protein, the volume to be transfused in any given case will depend on the medium chosen.

Bearing in mind the blood-volume of the patient in health, and the maximum probable loss of fluid from the circulation at the time of transfusion, it is possible to state how much of any one of these media can be administered with safety. These maximum volumes are: serum 3·4, citrated plasma 5·1, citrated whole blood 8 and defibrinated whole blood 6·6 bottles.

This estimate may serve as a check against the transfusion of excessive amounts when the interpretation of the clinical indications for dosage is difficult and the case-history unknown.

1. Hill, D. K. *Lancet*, 1941, **1**, 177.

CIVILIAN PSYCHIATRIC AIR-RAID CASUALTIES

By FELIX BROWN, D.M. Oxfd, M.R.C.P.
REGISTRAR IN PSYCHOLOGICAL MEDICINE AT GUY'S HOSPITAL; PSYCHIATRIST UNDER E.M.S.

THE psychological reaction of civilians to air-raids has been observed in the south-eastern sector, and it is now possible to classify the types of casualties occurring and make some suggestions for their treatment. The swarms of hysterics which were by some expected to follow bombing have not appeared, but nevertheless there are certain psychiatric disorders attributable to air-raids.

ACUTE EMOTIONAL SHOCK

The symptoms in mild cases of shock are tremor, sometimes violent, dilated pupils, and tachycardia, with an emotional state of fear, perhaps mixed with anxiety about relatives and property. There is usually extreme sensitivity to noise and considerable restlessness. This reaction may occur in anyone who has been in a bombed building, especially if he is anxious about an injured wife or husband.

CASE 1.—A man, aged 35, of previously normal personality was bombed while in a public-house. His wife had a flesh wound in the back. He was extremely tremulous and anxious, chiefly about his wife. Reassurance, a night in hospital and a strong sedative (Nembutal gr. 6) enabled him to recover and return to his normal life next day.

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ACUTE TRANSIENT HYSTERICAL REACTIONS

Some cases seen shortly after a bombardment are in a limp semistuporose state, usually with a tremor. These patients are acutely scared and seem to be groping for hysterical symptoms to give them peace of mind and forgetfulness of the incident.

CASE 2.—A married woman, aged 40, was seen half an hour after a raid. She complained of trembling of her hands, which she said were going stiff. She had dilated pupils and looked terrified. She held her fingers stiffly extended. She said "I was writing. I heard the bomb coming down, the crash came. Then all the windows came in on me. I ran for the door and the blast came in from outside. I went into my neighbour's flat, but she seemed to have a fit. I seemed to go all dizzy and collapsed. I thought I had a stroke." Her mother had died of a stroke; two of her sisters had had St. Vitus's dance. For the past 10 years she had complained of headaches and depression; she did not get on well with her husband, and resented sexual intercourse. Her symptoms had been better recently until this incident, as she had been able to mix with others in the public shelters.

No attempt was made to get rid of her hysterical symptoms at once, but she was reassured and given gr. 30 each of chloral hydrate and potassium bromide. It was not possible to admit her to hospital, but she was allowed to sleep for 3 hours in the outpatient department. On waking up and having a cup of tea she had lost her symptoms and was able to discuss her experience without terror; she had recovered enough to go to a friend's house. This patient had a previous history of psychoneurotic traits, and developed her shock in circumstances by no means exceptionally disturbing. The hysterical symptoms, however, were only of short duration.

CASE 3.—A hospital porter, aged 19, was seen about five minutes after being bombed. He was pale, looked shocked, his pupils were dilated and his pulse was of good volume, rate 70 per min. There was a slight superficial scratch on his forearm but no other physical abnormality. At first he was mute, gazing with a vacant stare at the ceiling. With some persuasion he was able to give his name and address slowly and with a severe stammer. After about ten minutes he was persuaded to give his history, still with a bad stammer. He had been within a few yards of one of a salvo of bombs which had hit a hospital building. He went among the wreckage, and was trying to rescue a woman trapped under a sink when another bomb exploded and blew him out of the window. He picked himself up, unhurt but dazed. After sitting down in an office he collapsed and was unconscious for a few minutes. When this history was being obtained he at first said "I don't

remember what happened." On being told that he did really but was afraid to think of it he continued. He wept when telling of the woman he was attempting to rescue. He was then reassured, and even persuaded to smile over a cup of tea.

He was admitted to the ward and given nembutal gr. 6, with which he slept well. The next day he still had a severe stammer and said he could not see properly. He had an hysterical ophthalmoplegia, neither accommodating nor moving his eyes but gazing fixedly upwards. He was reassured and told he was simply not bothering to look yet but would soon be well. The symptom was not taken seriously, nor was a transient complaint that his neck would not move (a radiogram revealed no bone injury). He was kept narcotised by nembutal, gr. 3 twice a day and gr. 6 at night for 3 days. He was then allowed up, and after another day was quite well and helped in the ward. His stammer had disappeared but he was a little hypersensitive to noises. He remained in the ward for a week, and is now at work. On one occasion since discharge he complained of insomnia, but this was easily controlled with a mild sedative. He now has no amnesia for the incident, which he is able to discuss without undue horror. He is a lad of previously normal personality, popular and sociable and keen on boxing. There are no neurotic traits in the family or previous history.

TREATMENT OF EMOTIONAL SHOCK AND TRANSIENT HYSTERIA

These patients are acutely exhausted emotionally by their terrifying experience; their great need is for rest. If the memory is too horrible to let the patient rest, he will forget it and develop some hysterical symptom. The first part of the treatment consists in taking a history of the incident from the patient, and if this is taken early his amnesic mechanism will not have had time to develop. Every effort must be made to persuade the patient to fill in the gaps in his story. This history-taking may even further distress the patient, and it has to be done tactfully, with frequent reassurance. If the patient is too dazed to give an account of himself, the history can be taken after he has slept.

The second part of the treatment is sleep. If a patient is brought to hospital for emotional shock his condition is probably more than simple fear which can be treated with reassurance and a dose of bromide. He has probably lost his home, and to discharge him from hospital to a public shelter is cruel and demoralising to others in the shelter. Mild cases should be given a sedative such as chloral hydrate and potassium bromide gr. 30 of each, and allowed to sleep for 3 hours in a quiet room of the outpatient department or first-aid post. If a reasonable home is available they can then be accompanied to it by a relative or friend. More severe cases should be allowed to sleep the night in hospital. A really adequate dose of sedative such as nembutal gr. 6, or sodium amytal 0·5 g. or morphine gr. ¼, and hyoscine gr. 1/100, should be given. If the patient is obviously severely shocked and incapacitated, as in case 3, he should be admitted to hospital for about a week. For the first two or three days the patient should be under narcotics, preferably barbiturates. He should sleep through the night, sleep about an hour during the morning and about 2 hours in the afternoon. About 13 hours sleep out of the 24 is desirable. After this he should get up and encouraged to work in the ward.

The Ministry of Health memorandum[1] says: "When hysterical symptoms predominate an attempt should be made at once to influence or remove them by suggestion, for instance by showing the patient that a powerless limb is not paralysed or anæsthetic, or by making a speechless patient phonate by coughing and then utter a single sound as 'Ah.' Hysterical tremor can be usually arrested by making the patient relax his muscles." This statement is to some extent misleading. It might be interpreted to mean that a terrified, tremulous and tottering patient, who has narrowly escaped death by bombing should be marched up and down to show him that his legs work still, then told to relax, pull himself together and go home. All he really needs is sleep and encouragement. Intensive symptomatic treatment has never been necessary with patients seen at this hospital as long as amnesia was prevented and they were allowed to sleep.

It has been suggested that admission to hospital is the worst thing that could happen to a patient suffering from emotional shock, as the patient comes to regard himself as an invalid and the condition is perpetuated. This has not been our experience. The patients admitted have all improved rapidly in the comparative security of hospital. They want to get well, and there is no such motive for invalidism as there was in shell-shocked soldiers in the last war. As soon as their minds are rested they recover. Some patients ask, during recovery, to be sent to a quiet hospital, away from the anti-aircraft barrage. This is impossible, but the noise does not interfere with their recovery. Even a few bombs in the hospital grounds, though scaring some of these patients, did not promote serious relapses. It is even possible that recovery while the patient is still in a noisy neighbourhood serves to desensitise him to noise.

For inpatients the third part of the treatment—occupational therapy and re-education—begins on the second or third day after admission. They are encouraged and even vigorously persuaded to get up and mix with the other patients and help with the work of the ward. On the next day they are given their clothes and sent out to work in the garden. Various other jobs, such as assisting in office work, are found for patients of different tastes. During this period psychotherapy in the form of reassurance and discussion of any persisting difficulties helps the patient to return to a normal existence. Before their discharge it is important to help the patients to obtain practical assistance for their problems. For this purpose a social service worker is most helpful. These problems include evacuation of wife and children, arrangements for the patient's accommodation in congenial surroundings if his house is destroyed, assistance with arrangements for repair and salvage of property. After being emotionally shocked by bombing any patient needs some assistance in dealing with his responsibilities; worry about them can considerably delay recovery.

PSYCHONEUROSES

Definite psychoneuroses, induced by air-raids in patients who have previously shown no psychoneurotic traits are comparatively rare, and the only cases seen have been examples of hysteria in some form. A particularly horrible experience is needed to precipitate this reaction in a previously normal person.

CASE 4.—A married insurance clerk, aged 44, was admitted to hospital for a suspected fracture of his clavicle after a bombing. No physical injury was found, but on the fourth day he was found to have an hysterical paralysis of his left arm. He was then seen for psychological investigation.

His complaint was: "I think this arm is crushed. I cannot use my shoulder, my arm burns horribly." He had been in a shelter 5 days before. In his words, "There was a thud, a shower of stuff on my head, I kicked myself free, the shelter had split open. I felt my left shoulder was jammed. I saw my wife's feet sticking out of the muck, I tried to pull her out but my left arm had no strength." His wife was subsequently rescued and was also in hospital. There was no abnormality in his family history; he had 3 normal siblings. There were no neurotic traits in childhood. He did well at school, then joined up for the last war where he saw active service in Mesopotamia; he did not develop shell-shock. Since the last war he has worked as an insurance clerk. He married at 26, and was happy with his wife. There were no children.

He was quite calm as he gave this somewhat negative history. He had a flaccid paralysis of the left wrist and forearm, glove type of anæsthesia of the left arm and hysterical ataxia. There was, however, some tenderness of the left radial nerve, probably due to traumatic neuritis, which had formed a basis for the hysterical symptoms. Of the incident itself, although he was not aware of any definite gap in his memory, he said "Everything happened in such a mist of pain and blackness I don't remember it properly." Simple persuasion was not enough to rid him of his symptom, and he was taken to a quiet room and 4 c.cm. of 10% Evipan was injected intravenously. On coming round from the anæsthesia he spoke spontaneously, while his eyes were closed with emotion which had been lacking in his previous account:

1. Memorandum for the Guidance of Medical Officers and other Personnel at First Aid Posts. E.M.S. Memo. No. 4. London, 1939, p. 11.

"I'll get you out, Dolly—I can't use my left arm. Say something. I'll pull you out. Someone will come soon. Let me catch hold of your feet. Dolly, I want you so. Oh, if I had a spade. I can't shift this concrete. Don't show a light or they'll see you. I don't want to go in no car. I must get the others out or I'll die. My back hurts. Oh my shoulder. Oh my knee! Come on, old girl." At this point he waved his right arm about and continued to do so for about ten minutes. "If my left arm was right I could do it. Damn old Hitler, if only I could get at the swine. Why can't I fit wings on my car? I'll teach them to bomb the girls and the kids. House, car, all the damn lot's gone. Never mind we can sleep in the tent. Thank God, I've got my Dolly. Poor little Betty, she's covered with blood. I don't want no doctor. Never mind about me, I can take it. Blimey, if they gave me a plane. Oh, Dolly, I thought you was a gonner. Damn the house, let it blow to hell as long as you're safe. I'll be late for the office, but they'll have to wait. Never mind, old girl, we'll take you up to the wilds of Scotland and we'll fish for some trout, never mind the trespassers will be prosecuted."

Quite suddenly his arm stopped waving and he continued on a completely different topic, alluding to his experience during the last war, when he was the sole survivor of an expedition in the desert in Mesopotamia. These were experiences of which he had previously told nothing. The following is a kind of jumbled running commentary of the whole incident, which had lasted almost a year. "I'll join up with the natives and go up country, shoving the boat down. We'll shove over round Alexandria if we have to. Six of us of the whole squadron. I'll shoot the first blasted Arab that pinches my grub. Think they can scare me with their tom-toms? What does the sheik give me his damn daughter for? Think I want to be a princess's gigolo? Where the hell can I get a boat? This sand is never ending. I'm damn thirsty. Anyway, old boy, pull your belt in, stick it, we'll find an oasis soon. What's that? Can I drive a motor-boat? I can drive anything. When I say full speed ahead we'll run through the swine. I'm going to beat it to England as soon as I can." He continued, describing how he caught a cargo boat and finally reached England. "What's this? Newport, home at last. Don't tell 'em anything, tell 'em you've been abroad and let them find out the rest. A pass to London, please. I'm sorry, Sir, I've lost all etiquette. I've come off the desert. No-one knows I made it. I've come off alone. What have I got a pith helmet for? Hello, mother, I've just come back to England. I've had a jolly fine time, no danger. I've been travelling about a lot. What did I do? Oh, odds and ends. Oh well, I'm all right now." He then returned to his original topic of the rescue of his wife. "Never mind. We've lost everything, we'll start again old girl. I'll be all right." He was then vigorously reassured that he would be well, and he woke up and was delighted to find that his arm was normal. He made a good recovery, and after a brief holiday in the country returned to work.

This case is particularly interesting, first because the patient gave such a vivid account of the psychological reaction to being bombed and secondly because it illustrates the reactivation of old experiences by the emotional disturbance of the bombing.

CASE 5.—A girl, aged 17, a machinist, had been living alone in the East End with her sister, aged 14. She had shown no definite neurotic traits, though she came of low-grade parents who had deserted her and she had always been somewhat timid and excitable. During a severe day raid, she was in a shop which she was told to leave when the raid started. When she went out into the street she met a friend, an epileptic, who took her into a public-house. This then received a direct hit, and all except herself and the epileptic were killed. She was calm until the epileptic had a fit, whereupon she began shrieking and continued for almost a quarter of an hour.

She was seen about a week after the incident. She complained of headache and insomnia. On questioning, she said she was afraid of going mad or losing control of herself as on the occasion of the bombing. She thought her headache implied impending insanity. She was partly reassured about this, but her home surroundings were most unsatisfactory. She was taken into the base hospital for a month. After a week some symptoms persisted and she was given evipan narcosis, under which she described vividly the scene of horror which precipitated her condition. "There is a man's head under the piano—I can't see where the body is. It's horrible. I'm going mad." She cried and seemed terrified. After suggestions of increased control and confidence, she became quiet. Following the narcosis she improved steadily and worked well in the needle-room of the hospital. A job was found for her in the country on her discharge a month after admission. The hospital was bombed during her treatment. She shrieked a little, but this did not in any way delay her recovery.

CASE 6.—The patient was a married factory inspector, aged 40, seen 2 months after being bombed and buried. He complained of tremor, nightly bedwetting, and attacks of intense cramp-like pain which woke him as soon as he went to sleep. Two months previously he had been on the way to visit his aunt to arrange for his uncle's funeral and a bomb dropped near him. On reaching his aunt's he found that she and her house had disappeared in an explosion. He then went with a friend to have a drink at a club. This received a direct hit, and he was buried for 5 hours. He was dug out dazed but unhurt. In his words: "I could not remember much, I did not seem to know where I lived." He was driven to the end of his street but on reaching his house he found the place disorganised by broken windows, and there was a bus-driver's arm in the top room, as a bomb had dropped outside. His one thought was to find his landlady to arrange for the repair of the house, but he had forgotten her name and address. He wandered in the streets all night looking for her. Finally he remembered her name and made the necessary arrangements. On attempting to carry on with his normal life he was troubled by the bedwetting and pain in his legs. He also suffered from fear of insanity and inability to concentrate which prevented him from working: "I'm scared of them seeing me dithery at work."

His family history was normal. His early history was normal, he had been a particularly active and robust man. He had had a successful army career, which was cut short some years ago by a scandal connected with dishonoured cheques. In spite of some alcoholism and extravagance he had been able to obtain good jobs after this. There was a lawsuit pending about some possible further frauds by him. He was in fact a somewhat unstable and erratic man, but had not shown any psychoneurotic traits before his series of bombing experiences. There had been no previous enuresis.

He was asked to relax and cast his mind back to the actual feeling of being buried. He became anxious and frightened and said "If only my watch had been luminous it would have been better. I was dying to see something. I was wanting to pass water all the time but I did not want to wet myself. And the cramp was horrible, I could not move my legs, they were pinned down." He then told how he did finally micturate, much against his will, and this gave him as much displeasure as anything. In addition he told of recent dreams of being in train smashes, in which his legs were pinned down, and that he wakes with the pain in his legs. The obvious interpretation that at night he re-enacts the unpleasant experience of being bombed, including wetting himself and the cramp in his legs, was made to him. He was at once much relieved, and his symptoms disappeared completely after one interview. He was seen two weeks later, when he was back at work and quite well.

CASE 7.—A married liftman, aged 56, had a severe hysterical tremor after the bombing of a block of flats. "I was woken up by the dog, the third floor was going. I got hold of the water pipe. I hung on to that with the dog on my chest. I called for help and can't remember any more." He was rescued hanging with his dog to a water pipe 40 ft. above the wreckage, under which the body of his 14-year-old son was buried. He had stayed by the wreckage for 5 days until the body was recovered. When seen a week after the incident he had slight headache and tremor. He refused to come into hospital, and it was not considered advisable to attempt to release his amnesia for the events, the memory of which might prove more than he could tolerate as he was a man of fairly low intelligence. When asked how he felt, he said "pretty fair" in spite of his experience. He had completely forgotten the horrors for which he had been able to substitute a symptom, and the symptom was considered best left untreated, since it did not inconvenience him greatly.

An essential feature of the psychoneuroses developing after bombing in previously non-psychoneurotic people seemed to be: 1. The extreme severity of the actual experience, or even the culmination of horrors needed to provoke the reaction. 2. The cases were usually seen after several weeks had elapsed since the incident, and their immediate reaction was probably that of acute emotional shock previously described; definite psychoneurotic

symptoms probably only formed after a period of meditation. 3. Treatment consists in analysing the problems and destroying any emotional amnesia the patient may have developed; and in providing routine work or occupational therapy if the patient is in hospital. The prognosis is excellent.

EXACERBATIONS OF EXISTING PSYCHONEUROSES

Exacerbations occur mainly in hysterics. No extreme danger is needed to provoke this reaction. Hysterical fits may recur in old hysterics. A situation provoking recurrence of an old hysteria is that of a timid woman of nervous personality, left alone in a house or shelter at night, who develops a hysterical symptom necessitating removal to hospital with resultant relief of the situation. Invariably there are other factors than the raids operating; on analysing them one finds situations such as unhappy marriage, unsatisfactory jobs and sexual difficulties. Such cases usually do well in hospital, and their admission is advisable because they are likely to be a nuisance in a public shelter.

REACTION OF ESTABLISHED PSYCHONEUROTICS

The reaction of some of the well-established psychoneuroses to bombing is remarkable. A long-established, complex-determined anxiety or obsessional state gives a patient a greater feeling of security from air-raids than 60 ft. of concrete. A psychoneurotic man said: "Oh, I'm not worried about the bombs—it's this queer tickly feeling in the back of my head." A woman of 31, with obsessional fears of murder and suicide and knives, who was sexually frigid, said "I'm afraid I can't get very concerned about bombs; I wish I could, it would be more normal." She was leading an ordinary life in a heavily bombed area. Her condition was related to guilt feelings about an episode of infidelity to her husband, but it represented a complicated psychoneurosis with ramifications in her earliest childhood. Psychotherapy proceeded uninterruptedly even when, on one occasion, bombs were crashing round the outpatient department, the patient remaining completely indifferent. External happenings such as bombs were trivial compared with the internal conflicts which were always with her.

CASE 8.—An unmarried dental mechanic, aged 28, had been attending Guy's psychiatric outpatients since 1937 for an obstinate psychoneurotic depression, which was related to his failure to emancipate himself from his mother. There were in addition numerous sex-guilt factors, some of which dated back to his earliest childhood. He had an extremely shy and timid personality. Attempts were made to help him to free himself and take up outside interests, but without success. At the beginning of the war he joined a first-aid post. The year of inactivity he found tedious, and was worried by one of his colleagues who used to discuss Freudian psycho-analysis. When the raids developed, however, he lost all his psychoneurotic symptoms and behaved in a thoroughly heroic manner. He rescued people from bombed buildings while bombs were falling, and had some very narrow escapes. His own house was bombed, his mother being taken to hospital slightly wounded, but he developed no symptoms and carried on with his work.

This man would probably have broken down early in the Army, and he had been given a certificate to that effect. It seems that this type of personality is able to adjust much better in civilian A.R.P. work, where duty is of obvious and imperative importance, and connected with saving life, rather than in the combatant services.

The extraordinary toughness of some well-established psychoneurotics to aerial bombardment may be due to the fact that they are to some extent reassured by seeing other people being as worried as they have felt for years. Another reason may be that the whole of their emotional tone and affect is concerned with their own problems, usually related to sexual difficulties, and there is no affect left for simple bodily fear. In some cases the urgency of the moment does serve to inhibit the patient's long-standing emotional conflicts, with resultant clinical improvement. In the Russian revolution it was said that the obsessional psychoneurosis became extinct owing to the urgency of the times. In the cases seen among civilians here the obsessional state seems to have remained unaffected by the raids, and only served to give the patient immunity from fear of them. The patients who have been almost cured of their complaints by the raids have been suffering from anxiety state or psychoneurotic depressions, and have never been able to develop sufficient outside interests.

PSYCHOSES DEVELOPING IN APPARENTLY NORMAL PATIENTS

When a psychosis develops in an apparently normal person there is usually some previous abnormality or predisposing conflict which has left the patient emotionally insecure.

CASE 9.—Acute paranoid panic psychosis. A married woman, aged 53, was admitted to the observation ward after having made a violent attack on a neighbour. She was brought in by four A.R.P. men, one of whom she had severely mauled. She had been well until 3 days before admission, when some bombs dropped in the neighbourhood. She rushed under the stairs with a gas-mask and said "Here the Germans come." She did not, however, seem exceptionally frightened. The next night she saw a light, which she reported, and then began saying that the neighbours were in league with the Gestapo. She met one of the neighbours and chased her savagely down the street with wild yells. She was then brought to hospital.

Her family history was normal. She had had a rigid Victorian upbringing but a fairly happy childhood. She did well at school and worked as a saleswoman in London until she married at 37. The marriage was not consummated, as she had a distaste for sexual intercourse. In her words: "He was too fond of me to hurt me." The marriage was happy, however, and she and her husband were very dependent on one another. For a year before admission, she had had dermatitis artefacta. She had been reasonably sociable, somewhat imaginative, and keen on arts and crafts.

On admission she was fighting wildly and shouted "Oh help, it's the Gestapo. Go away, I'm a gas-mask." Here she inhaled through her blanket, and said "What's that on the bed? It's poison gas." She was quite disoriented and confused. She was given sodium amytal, 0·5 g., intramuscularly and slept deeply. Next morning she made a homicidal attempt on the ward sister, whom she called a Gestapo agent. She was kept narcotised with sodium amytal, 0·5 g., every six hours for 3 days. Every effort was made to reassure her about her surroundings, and her husband was allowed to sit with her all day. After 10 days she regained her normal personality. She remembered her experience and said it was due to fright. She was discharged and has remained well. In this case the psychosis developed without a particularly terrifying experience. Her previous insecurity is shown by her dermatitis artefacta (which recovered completely during the psychosis) and by her sexual frigidity.

CASE 10.—A married woman of half Irish parentage, aged 52, was admitted to hospital for hysterical aphonia following her collapse in the street after an air-raid. Five weeks before admission she was alone in the house and her husband was late home. She heard that his factory had been bombed; she was very tense on his return. Next morning she had to quit her house owing to a time bomb. She was well for a day, living with her daughter, but on seeing a burning gas main she collapsed and was brought into hospital.

There was no abnormality in the family history. She had always been a seclusive, home-loving woman, with no outside interests, a devout Roman Catholic. There had been no previous breakdown. She had had an appendectomy at 20, prolapse operations at 35, and operation for fistula. Her married life was happy, but her husband had recently been on night work, and she had been left alone at nights. She had a grown-up son and daughter. Since her son's marriage two years ago she had been jumpy and nervous, and had been much upset when he subsequently developed tuberculosis.

I was consulted three weeks after her admission to a reception hospital, as she had not improved. She then presented the typical picture of hysterical aphonia, except that she was still tense and restless; the symptom had not given peace of mind. She gave a reasonable account of herself and was obviously much worried about her son and the disturbance of her routine by the time bomb. The symptom of aphonia was very slight and easily disappeared, but since her home was not ready she was transferred to a base hospital. Here she developed paranoid symptoms. There was a period in which it did not seem clear whether paranoid or hysterical features would predominate. She said "You

know what they are trying to do to me. I'll go to church and get sanctuary there. You know I am not faking. It was terrible, those bombs. They turned us out without time to dress. I can't speak properly. They all get in bunches and turn their backs on me. I can hardly see. They've been doing their silly film acting on me." For the next few days she alternated between hysterical aphonia for a day, without delusions, and a gradually increasing paranoid excitement in which she said something immoral was going on upstairs and that her eyes were plastered with sticky paper. Her affect in the paranoid state was one of intense fear. Finally the paranoid panic predominated and she became elaborately hallucinated. She said "I'm scared. There are voices all round the room shouting my name. People try to scare me by talking of gas bombs. I have a bad eye, I don't know who did that. They keep saying knives and cats are inside me, I don't see how they would crawl in. They tap out messages, they are taking down messages with dictaphones." She was finally certified and sent to a mental hospital. Her prognosis, in view of the acuteness of the illness, is likely to be moderately good.

This patient, although her first psychosis seems to have been precipitated by the bombing experiences, had undoubtedly been in a tense, insecure state for at least two years before this psychosis, and it is possible that the psychosis would have developed without air-raids. Moreover, the bombing experience was not by any means a severe one. Particularly interesting was the fact that recovery from hysteria released a severe psychosis. Sedatives and reassurance did nothing to influence this deterioration.

DEPRESSIVE PSYCHOSIS

The depressive psychosis can be precipitated by bombing, and is a commoner reaction than the paranoid panic state. Some previous features of insecurity have been present in all the cases seen, although no previous psychosis has occurred.

CASE 11.—An unmarried surveyor, aged 52, was transferred from a reception hospital to the base hospital 36 hours after being bombed in a shelter. He complained of feeling depressed and frightened, and blamed himself for the death of the people in the shelter. He had been on duty as shelter marshal when a heavy bomb hit the shelter and everyone else in his half of the shelter was killed. He only received a bruise on the back. In his words "I was changing the lights over, the bomb exploded, the shelter was smashed. My job was to get the services as soon as possible. I tried to get out the kids. A brick had hit me in the back." He apparently did fetch help, and then began crying and shaking. He was taken to hospital, where his ward was hit by an incendiary bomb; he tried to get out and was soundly scolded. He did not sleep that night and in the morning was told he was to be discharged, but as he told the ward sister he intended to commit suicide, he was transferred to the base hospital.

There was no family history of nervous illness. His father had been bad-tempered and an alcoholic. His mother, to whom he had been deeply attached, died of diabetes in 1922. There were no siblings. As a child he used to sleep with his mother until he was 12. He suffered from night terrors of a man coming to suffocate him. He did excellently at school, and worked himself up to some distinction in his profession. In the last war he was hit by a shell fragment and was jumpy and nervy for a year afterwards, but was not discharged from the Army. He was subsequently in a torpedoed ship and floated in the sea for 6 hours, but without any lasting nervous after-effects. The sexual history was negative. He said his mother was the only woman he had ever loved, he was much depressed by her death, constantly thought of her and kept relics of her by his bedside. He had been engaged once, but as the woman wanted to supplant his mother he gave her up. He had had no promiscuous intercourse, in fact said that his tight foreskin and small penis would render this impossible. He was popular at work, religious, and made every effort to lead an extremely virtuous life. He had lived alone in his mother's house since her death.

He was a depressed man of pyknic habitus; he wept frequently in telling his story. He said: "There were 25 people in the shelter; 10 would not have been there if it had not been for me. I used to give them cakes and medicines. I looked after them. They would have been alive today if it had not been for me. I murdered them. I'm supposed to save life, not take it." He was given heavy doses of barbiturates for 3 days, during which he slept most of the time. He gradually lost his delusion of guilt, but for some weeks remained sensitive and upset by noises, and occasionally would have exacerbations of self-reproach, calling himself a coward. He had a relapse of depression for 2 days after the hospital was bombed, but while the actual rescue work was going on he was quite symptomless and offered to help. The reaction only occurred an hour afterwards. He remained somewhat tense, and a month after admission he was given evipan hypnosis. Under this he spoke for some time, calling on his mother. He said "I have only lived for you." He told what a wicked boy he had been, how his mother had once found him masturbating and scolded him about it. "I've always tried to atone for this, I've tried to be chaste as she said, but I sometimes did it after what she told me." He was reassured emphatically, since he had obviously felt very guilty about this incident. He also spoke of the actual bomb experience, but there was no essential addition to his previous account. He was told under hypnosis he would feel much better, and on waking up he was extremely euphoric for about a day, but considerable improvement was maintained. With psychotherapy he made a gradual recovery and was well enough to be discharged to work 9 weeks after admission, though some depressive features persisted.

This patient illustrates how a bomb explosion can release underlying conflicts which normally would probably never have led to a psychosis. When these conflicts, relating to very early guilt feelings, have once been disturbed by the intense emotion of fear they have to be solved and treated by fairly intricate psychiatric methods. This patient was not acutely psychotic, but his depression, delusion of guilt and suicidal urges rendered the diagnosis of mild depressive psychosis certain.

Several more severe depressions have been seen, especially in elderly men. No case of mania has been seen, in a previously normal person, directly resulting from an air-raid.

Although an absolutely normal person does not develop a psychosis in the stress of bombing, some of the cases we have seen probably would not have developed a psychosis if they had not been bombed. The treatment of these psychoses does not differ essentially from that suitable for the corresponding psychoses of peace-time. It is, however, worth while to give them a few days of narcosis on first entering hospital.

RECURRENCE OF PSYCHOSES

Air-raids can be considered to be one of the factors precipitating the illness in most of the manic and depressive psychoses occurring in bombed areas. Underlying personal and constitutional insecurity is considerable in these patients, and many of them would have had a recurrence of their psychoses without air-raids. Some, however, seemed to have been reasonably adjusted and recovered until their routine was disturbed by raids. No definite narrow escape from death is needed to precipitate another psychotic incident.

CASE 12.—A woman, aged 44, was admitted in a manic excitement. She had been living quietly with her sister, but 6 weeks before admission she had become excited about air-raids, and more and more restless and talkative, though she said she was not scared. Gradually her conversation became continuous and incoherent and she could not be managed at home.

Her parents had not suffered from mental illness but one sister of 10 siblings had had an attack of mania. She had been a healthy child, became a teacher and married at 23. Her husband died after three years of marriage. She remarried at 28, but this marriage proved unhappy and at 31 she separated from her second husband. After this she developed an attack of mania, for which she was in hospital for 6 months. She made a good recovery and lived normally a fairly sheltered life until the present breakdown. On admission she was overactive, occasionally violent to the nurses, and erotic to any man. She was cheerful and voluble, shouting things like "Oh, I say. Oh, right-oh, come a bit nearer and I'll give you a kiss. Oh, I can't trust you. What else do you want me to say? I'd like to have that watch." She was certified and referred to a mental hospital, where she will probably make a good recovery.

This type of case must be common in every observation ward in London. The precipitating factor in these unstable personalities is the general unrest and the

insomnia due to raids, rather than any bombing experience. A period of mental hospital treatment is usually necessary.

ESTABLISHED PSYCHOTIC PATIENTS

Patients suffering from an already established psychosis are usually abnormally unmoved by air-raids. This is what one would expect of people whose whole emotional attention is directed to their internal conflicts. One severe paranoid schizophrenic patient, with delusions that people were spreading rumours that he was carrying on homosexual activities, was quite unaffected by raids, being able to improve and return to work as an insurance clerk in London. In some cases the war enters the delusional content.

One woman of 45 who had been psychotic since the start of the war, and particularly paranoid against her brother-in-law, said that every night her relatives came over in aeroplanes and tried to bomb her, but so far they had failed to harm her. Another woman of 50 with long-standing paranoid delusions said that the neighbours were accusing her of bombing them. "It's absurd of them to say such wicked things, how could I bomb them?" she added. The psychosis, however, remained completely unaltered, and she is able to do a full day's work in a munitions factory.

SENILE DEMENTIA PRECIPITATED BY AIR-RAIDS

A large number of men and women over 70 are evacuated to the base hospitals from bombed areas. These are sent into hospital because their homes are bombed or because their relatives are no longer able to take care of them. Such cases are often admitted as "war neurosis" and classified as "serious casualty." They had usually been reasonably well-adjusted at home, leading a quiet life, gossiping with neighbours or sitting by the fireside, but in some cases their memories had been failing for years. Often they had never been in hospital before. The adjustability of these elderly people is poor, and on entry to hospital many of them become disoriented; they cannot understand what is happening around them, and may develop paranoid delusions that the nurses are scheming against them. In addition to disorientation there may also be severe depression. Senile dementia in fact tends to develop, and may lead to death fairly rapidly.

CASE 13.—A retired baker, aged 70, previously fit, was admitted because the house where he had been living with his daughter was damaged. His daughter left town and was unable to take him with her. Shortly after admission he became confused and restless, did not know where he was, and muttered "They are poisoning me." His condition steadily deteriorated and he died within a fortnight of bronchopneumonia.

These elderly people are quite unsuited for the base hospital, where they constitute a serious problem. The best treatment is undoubtedly to discharge them to some familiar environment and company. Often, however, this is not possible. They are more suited for some form of ambulant hostel life than for life in hospital.

DISCUSSION

The types of psychological air-raid casualties among civilians resemble those described among soldiers, but there are certain differences. A civilian population is completely unselected, includes the old and the young, both sexes, and the already emotionally unstable as well as the mentally sound. Thus there are not only the immediate reactions of healthy people to a severe shock but also the effects of prolonged stress on the weaker members of the community. For this reason psychoses are probably relatively commoner air-raid sequels among civilians than among soldiers. Senile dementia constitutes a special problem. No acute emotional-shock reactions among children have been seen. Women seem to be by no means a weakening element in the general population, in fact the male cases of emotional shock and psychoneurosis seen resulting from air-raids outnumber the females in the ratio 30 to 18. A civilian is not a member of any organised conscript body from which he can escape by invalidism; there is for him no immediate prospect of pension; there is no medical board to be considered. In fact there is no motive for continuation of symptoms any longer than he can help. This probably accounts for the excellent prognosis of the civilian air-raid psychoneuroses and emotional-shock states if adequately and early treated.

The incidence of genuine psychiatric air-raid casualties has been much lower than might have been expected; the average previously healthy civilian has proved remarkably adjustable.

SUMMARY

Civilian psychiatric casualties are classified into the following groups.

1. Mild and severe emotional shock, treated by: taking a detailed history; putting the patient at rest under sedatives for hours or days according to severity; and arranging for rehabilitation, occupational therapy or discharge to congenial surroundings. A severe bombing experience is needed to produce this reaction in normal people.

2. Psychoneurosis, usually hysteria, associated with amnesia for the provoking incident. These have been treated by psychotherapy or evipan narcosis designed to eliminate the hysterical amnesia, and occupational therapy combined with continuation of psychotherapy to deal with other problems reactivated by the bombing. A very severe bombing experience is needed to provoke a hysterical reaction in a normal person.

3. Psychoses, usually panic and depressive states. Personal insecurity is present in most cases which develop a psychosis after bombing. These have been treated in the same ways as the corresponding psychoses of peacetime. Many cases of senile dementia are precipitated by hospitalisation after air-raids. Established psychoneuroses of the anxiety-state and obsessional types are usually unaffected by raids. Most patients with established psychoses are also unaffected by air-raids.

ABSORPTION AND EXCRETION OF SULPHONAMIDES APPLIED LOCALLY

OBSERVATIONS IN RABBITS

BY

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MUCH work has now been published on the promising results of the local application of sulphonamide compounds to wounds, but comparatively little has been recorded of the rate of absorption and excretion, and of the proportion of the drug which undergoes conjugation, after local application.

Jensen, Johnsrud and Nelson (1939) recorded two blood-concentration curves in man after the topical application of 10 g. and 6 g. of sulphanilamide respectively to compound fractures. The maximum blood-concentrations reached were 14 mg. per 100 ml. in 18 hours after the 10 g. dose, and 6 mg. per 100 ml. in 12 hours after the 6 g. dose.

Legroux (1940) found a maximal blood-concentration of 4–5 mg. per 100 ml., 24 hours after the local application of sulphanilamide in animal experiments. All traces had disappeared from the blood in four days.

Herell and Brown (1940) found that appreciable concentrations of sulphanilamide in the blood were obtained from 1·6 g. only when applied to the large pleural or peritoneal absorptive surfaces. When applied in other localities the quantity of drug in the blood was too small to detect.

McIntosh and Selbie (1941) recorded values of over 40 mg. per 100 ml. after intramuscular injection of 20 mg. of sulphanilamide in mice. The dose given was very large—if the mouse is assumed to have weighed 20 g. it corresponds to a dose of 70 g. for a 70 kg. man. With sulphapyridine, the blood-concentration after intramuscular injection was much lower, and never exceeded 5 mg. per 100 ml.

Hawking and Piercy (1941), using single applications of 5 g. of sulphanilamide or sulphathiazole, found a maximum blood-concentration which rarely exceeded 1·5 mg. per 100 ml. in 24 hours. After 48 hours the concentration was with one exception negligible.

The following observations were undertaken to obtain further information on the rates of absorption, conjugation and excretion of sulphanilamide, sulphapyridine and sulphathiazole after their application to uninfected wounds in rabbits.

TECHNIQUE

Rabbits, after having had an area of skin shaved, were anæsthetised with ether, and a wound made on the right flank. In most of the experiments a portion of skin about 1 sq. in. in area was removed, the subcutaneous tissues divided, and the powdered drug spread on the surface of the muscles. The skin was loosely drawn together with a catgut suture. In a second series, in addition to the skin wound, a portion of the extensor muscles of the thigh roughly the same size as the skin area was also removed.

All the drugs were finely powdered and passed through a No. 60 sieve. The dosage employed was based on that recommended for local application in the Medical Research Council War Memorandum No. 2 (1940) on the treatment of gas gangrene, in which 5–15 g. of powdered drug is suggested as a suitable dose. Since this dosage is for an adult male, 0·15 g. per kg. of body-weight, corresponding to just over 10 g. for an adult of 70 kg. was selected as the dosage to be applied to the rabbit wounds. Blood samples were taken at intervals from the ear, and urine was collected as excreted for a week after operation by the use of a metabolism cage. Chemical estimations were made by the method of Marshall and Litchfield (1938), and blank determinations were made in every case for the coloured urine samples. Werner's method of estimation (1939) was tried and abandoned, as it was found to be useless for coloured urine samples and for the low blood-concentrations obtained with sulphapyridine.

RESULTS

Sulphanilamide.—A maximum blood concentration of 1 to 5 mg. per 100 ml. of "free" sulphanilamide was attained about 5 hours after application. Thereafter the fall in concentration was rapid, and if it were required to maintain the level at about 2 mg. per 100 ml., oral administration would have to be commenced 6 hours after local application. Excretion was rapid, about 50% of the dose applied being eliminated in 24 hours. About 90% of the excreted drug was in the conjugated form.

Sulphapyridine.—The level of free sulphapyridine was in every experiment very low, and all traces had disappeared within 24 hours. The concentration of "total" drug reached a value of about 0·5 mg. per 100 ml. in 3–4 hours, and this only gradually decreased. Excretion was slower than with sulphanilamide, about 7% of the dose applied being eliminated in 24 hours. About 70–80% of the excreted drug was conjugated.

Sulphathiazole.—The maximum concentration of about 0·75 mg. per 100 ml. of free sulphathiazole was reached in 5 hours, and the subsequent decrease was less rapid than with sulphanilamide. The rate of excretion was intermediate between sulphanilamide and sulphapyridine, about 18% of the dose being eliminated in 24 hours. About 75% of the excreted drug was conjugated.

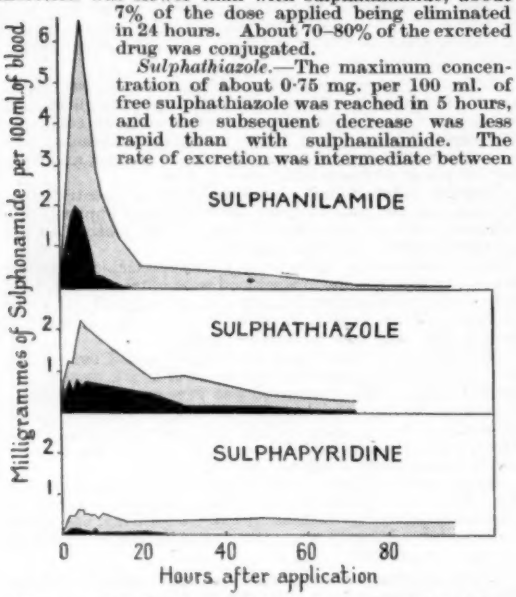

FIG. 1—Concentrations of sulphonamide compounds in the blood after local application to wounds.

In each figure, black = free sulphonamide, stipple = total sulphonamide.

Little difference was observed between the rates of absorption from wounds made in the skin, and from those involving the thigh muscles.

The results of typical experiments are shown graphically in figs. 1 and 2.

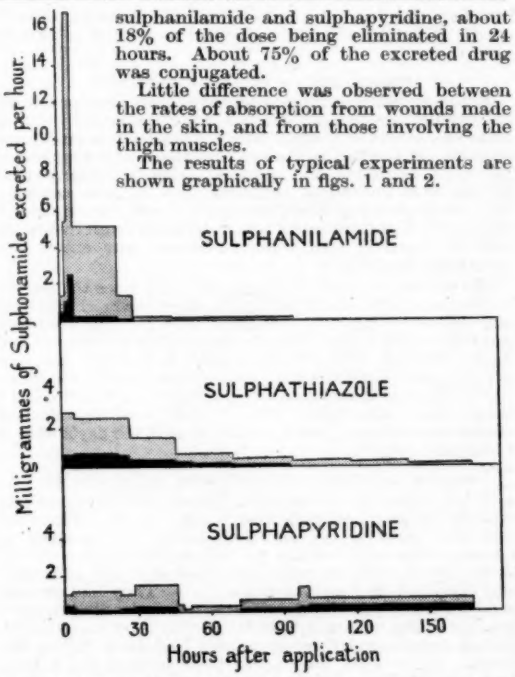

FIG. 2—Urinary excretion of sulphonamide compounds after local application to wounds.

COMMENTARY

The results show that although it is possible to obtain an effective concentration of over 2 mg. per 100 ml. of blood for a short period by the local application of sulphanilamide, this is not possible with either sulphapyridine or sulphathiazole. These latter substances are removed too slowly from the site of application for a high blood-concentration to be produced, and although an increase in the quantity of sulphanilamide applied would increase the blood-concentration, an increase in dose of the less soluble compounds would not greatly raise the blood-concentration obtained unless the absorptive surfaces were very large, as in Herell and Brown's observations. The proved clinical value of the substances when applied in doses as low as 5 g. (Hawking and Piercy 1941) must therefore be due to the local effects of the drug. Local application in experimental gas-gangrene has been shown to be more effective than intraperitoneal doses by Hawking (1941), and more effective than oral doses by Reed and Orr (1941). If the effective prophylactic concentration of 2 mg. per 100 ml. of blood recommended by Fuller and James (1940) were required, this would have to be provided by supplementary oral dosage.

All our experiments were made on clean, uninfected wounds. It is possible that the rates of absorption from grossly infected wounds would be modified.

SUMMARY

Sulphanilamide, sulphapyridine and sulphathiazole were applied to uninfected wounds in the rabbit, and the rates of absorption and excretion estimated.

With the size of wound and dosage used, it was possible to obtain a blood-concentration of over 2 mg. per 100 ml. for a short period with sulphanilamide. The other two compounds were not absorbed rapidly enough for this value to be attained.

Sulphanilamide was excreted rapidly, sulphathiazole less rapidly, and sulphapyridine less rapidly still. About 90% of excreted sulphanilamide, and 75% of excreted sulphathiazole or sulphapyridine was in the conjugated form.

Our thanks are due to Mr. J. Williams for technical assistance.

Continued at foot of next page

THORACOPLASTY FOR PULMONARY TUBERCULOSIS

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THE material for this review is taken from the records of 69 male patients who had thoracoplasty at Colindale Hospital between 1933 and the end of March, 1939. The hospital does not receive many cases with early or limited tuberculous disease and the results show what can be done in an unfavourable field. For example, in 1938–39, of 800 patients, 33 were offered thoracoplasty and only 13 accepted.

In 2 cases of our series of 69 the operation was not completed. The remaining 67 fall into five groups according to the grounds for the operation :—

	Cases and per cent.
1. For parenchymatous disease alone	54 (80·5)
2. For draining empyema	8 (12)
3. For tuberculous empyema	1 (1·5)
4. After removal of wax	2 (3)
5. After extrapleural pneumothorax	2 (3)

The first group only will be reviewed in detail here. For comparison, it is worth surveying some published results from other centres.

Freedlander and Wolpaw (1937) reviewed 85 cases which correspond to the first group, and compared their history with that of 58 patients who had refused thoracoplasty; after from two to four years 57% of the surgically treated group had become closed cases (closed cavity and T.B. negative sputum), 13% were unchanged or worse, 9% improved, 14% dead and the remainder untraced; in the controls the corresponding figures were 10% "closed," 49% worse or unchanged, 7% improved, 26% dead and the rest untraced.

Peters and Cornish (1938) found a disparity in results between those cases which had a complete and those which had a partial thoracoplasty. Of 40 who had the complete operation, 21% were quiescent, 25% still active, 54% dead, while of 38 who had the partial operation, 50% were quiescent, 16% active and 34% dead. The fatalities seem more than usually high.

Dolley, Jones and Paxton (1939) collated results from fourteen sources (1636 patients), including their own centre, and found that after an average period of at least two years 39·6% were able to work, 26% were improved, 15·6% unimproved and 18·8% dead. Carlson and others (1939) reviewed 50 cases 1½–2 years after operation; 50% had closed cavities and negative sputum, and 24% were dead. Sommer and Ehler (1940) had rather better results in their 177 patients, of whom 79% had closed cavities and negative sputum. Only 12% were dead after a follow-up period averaging thirty months. O'Brien and others (1940) report 511 patients, including 97 with contralateral pneumothorax, 17 with tuberculous empyema, and 9 diabetics. Cavity closure was effected in 87%, sputum became negative in 81·6%. Now 65·5% are cured, arrested or quiescent and 19% dead, the rest being unstable or untraced.

PROCEDURE

The earlier, and many of the later, cases of the present series were anæsthetised with gas-oxygen-ether. Cyclopropane, usually with a preliminary injection of Evipan, has been largely used since 1936; it is ideal during the operation but there is an impression that it has led to increased post-operative collapse. In the last two years local anæsthesia has taken pride of place. It might have been expected that the cases earlier in the series would have been submitted to fewer stages; in fact, up to December, 1936, an average of 2 stages was done in each, and there was only a slight increase—to an average of 2·4 stages—after that date. Almost invariably the upper stage was performed first. Disarticulation of the posterior ends of the ribs has been the rule where possible. Since February, 1936, Holst and Semb's method of mobilising the apex of the lung by doing an extrafascial pneumolysis has been practised in 23 (42·6%) of this group. After his last stage the patient is kept in bed for at least three months, and it is another thirteen weeks, on the average, before he can be moved to a convalescent home or sanatorium in the country. Few patients resume home life in under a year from the date of their operation. While bed treatment continues, weights (gradually increased from 3 to 25 lb.) are used to increase the falling-in of the chest-wall, and the patient is fitted with a brace when he gets up. Massage to the limbs is started early.

Selection of cases is of prime importance from the point of view of the chest physician. The decision to operate is seldom easily made and nearly all patients have by then spent months in the hospital. At Colindale the pros and cons of treatment are thrashed out at a periodical medical clinic. Almost all the patients were subjected to other forms of active treatment before undergoing thoracoplasty. An artificial pneumothorax had been carried out or attempted on the thoracoplasty side in 48 cases and on the opposite side in 4 cases. It was maintained on the same side in 2 and on the opposite side in 2; 9 patients had had phrenic crush and 2 avulsion on the opposite side.

GENERAL RESULTS

The follow-up was done at least a year after the last stage in each case, and conclusions were based on interviews with patients and information received from tuberculosis officers. Table I gives the findings in the cases where thoracoplasty was done for parenchymatous disease alone. "Quiescent" as used in these tables includes some cases which are arrested or cured; all patients so classed were sputum-negative and fit at least a year after operation.

TABLE I—FINDINGS OF FOLLOW-UP INQUIRY MADE AT LEAST A YEAR AFTER FINAL STAGE IN PATIENTS SUBMITTED TO THORACOPLASTY FOR PARENCHYMATOUS DISEASE ALONE

—	All cases	Operated on at least 3 years ago
No. of cases	54	32
Dead	10 (18%)*	8 (25%)
Going downhill ..	2 (4%)	1 (3%)
Active disease ..	7 (13%)	2 (6%)
Quiescent	35 (65%)	21 (66%)

* Of these, 6 died immediately or soon after operation.

Of the 44 patients alive at least a year after operation 28 (64%) are known to be working; this figure includes 25 (71%) of the quiescent cases and 2 with active disease. Some of those seen recently are in the following occupations: coalporter, packer, messenger, labourer, salesman, clerk, draughtsman, insurance agent and Salvation Army officer.

Age.—We have been chary of recommending thoracoplasty after the age of 40. The age-groups of the 54 cases were :—

	Cases and per cent.
17–25	24 (44·5)
26–35	24 (44·5)
36–45	5 (9)
46–55	0
56–65	1 (2)

The last case was aged 57; he was not upset by a two-stage operation which seemed to be completely successful, but he died a year later from further spread of disease. A boy aged 17 now shows advanced scoliosis, but no conclusion can be drawn from this.

Chronicity and type of disease.—A number of cases had had tuberculosis for a long time but if (to avoid overloading) the longest history is restricted to 36 months, the average period between the onset of symptoms and the date of operation is 26 months; 11 patients had been

MR. GOODWIN AND DR. FINDLAY: REFERENCES

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ill for a year or less. The radiograms in all cases except 1 showed proliferative changes, and most showed fibrotic elements as well; 12 (22%) showed exudative foci. Radiological criteria do not reveal a high percentage with active bilateral disease (table II). An average of 2·2 lobes were actively affected in each.

TABLE II—RESULTS ACCORDING TO DISTRIBUTION OF DISEASE AND SIZE OF CAVITY TO BE COLLAPSED

—	Unilateral, or healed disease in opposite lung				Active disease in opp. lung
	Diameter of cavity			Total Cases	
	Under 1 cm.	1–3 cm.	Over 3 cm.		
No. of cases ..	9	15	18	42	12
Dead	2 (22%)	1 (7%)	6 (33%)	9 (21%)	1 (8%)
Going downhill	0	2 (13%)	0	2 (5%)	0
Active disease ..	1 (11%)	2 (13%)	1 (6%)	4 (10%)	3 (25%)
Quiescent ..	6 (67%)	10 (67%)	11 (61%)	27 (64%)	8 (67%)

The numbers are too small to allow of an accurate conclusion. In only 2 of the cases with active contralateral disease were cavities—small in both—in the opposite lung, and in another 2 there was a contralateral A.P. Two-thirds of the cases with large cavities who died did so within a short time of operation.

General condition before operation.—In 13 (24%) the patients' condition before operation was described as good, in the remainder usually fair. Vital capacity has not been estimated until recently. Special blood examinations play a part in our assessment of resistance and

TABLE III—BLOOD EXAMINATION AS AN INDEX TO RESULTS

—	V.B. count and Houghton index		Sedimentation-rate	
	Good blood	Poor blood	15 or lower	20 or over
No. of cases ..	24	22	22	21
Dead	2 (8·5%)	4 (18%)	1 (4·5%)	6 (28·5%
Going downhill	1 (4%)	1 (5%)	1 (4·5%)	1 (5%)
Active disease ..	2 (8·5%)	4 (18%)	3 (13·5%)	2 (9·5%)
Quiescent ..	19 (79%)	13 (59%)	17 (77·5%)	12 (57%)

toxicity. Differential white-cell count, Von Bonsdorff count (V.B.), erythrocyte-sedimentation rate and, finally, the calculation from these factors of the Houghton index (Houghton 1939) are useful. The V.B. count and the Houghton index are each normal at approximately 260. In table III "good" blood is arbitrarily defined as having a V.B. count of at least 190 and a Houghton index of at least 200; "poor" blood as having a Houghton index below 165 or both index and V.B. count below 200. The erythrocyte-sedimentation rate has never seemed so useful as the full examination, but it has some value; the Westergren method was used here.

TABLE IV—TYPE OF OPERATION IN PATIENTS WITH UNILATERAL DISEASE, EXCLUDING THOSE WHO DIED WITHIN A SHORT TIME OF OPERATION

—	Partial (8 ribs or less)	Complete (9 ribs or more)	Without pneumolysis	With pneumolysis
No. of cases ..	24	12	19	18
Dead	3 (12·5%)	1 (8%)	2 (11%)	2 (11%)
Going downhill	1 (4%)	1 (8%)	1 (5%)	1 (5·5%)
Active disease ..	4 (17%)	0	1 (5%)	3 (16·5%
Quiescent ..	16 (66·5%)	10 (84%)	15 (79%)	12 (67%)

Type of operation.—Table IV suggests that a complete thoracoplasty may, because of more efficient collapse, be more effective than a partial one. The addition of a Semb "strip" seemed to give a much more efficient collapse, but did not affect the results.

Paralysed diaphragm at the time of operation.—Paralysis on the same side was present in 13 patients; of these, 3 died within a short time of operation (2 of bronchopneumonia on the same side and 1 of sepsis). Paralysis of the opposite diaphragm was present in 2, of whom 1 died of cardiorespiratory failure (undoubtedly accentuated by the paralysis) after the first stage of the operation; the other died three years after thoracoplasty. Omitting the fatal cases, immediate reactions were not common in those with paralysed diaphragms and bronchiectasis was not a common sequel. We should hesitate now to do a thoracoplasty in a patient whose contralateral diaphragm was out of action.

Other factors which might bear on results are failure of the operation to render the sputum negative and its failure to close a cavity. On leaving the hospital 13 patients had positive sputum; 4 of these remained positive after periods of from one to four years, while 9 became quiescent. It must be remembered that the patient usually goes on to a convalescent home or sanatorium.

Of the 44 cases still alive, 3 had no cavity before operation. Of the 33 in whom the lesion was quiescent the cavity had apparently closed in 29 and was reduced in size in 4. There were 8 patients who still had an active lesion or were going downhill, though in 2 the cavity was apparently reduced in size and in the other 6 had apparently closed; of these 6, however, 4 had disease in the opposite lung. Tomographic examination was not available.

CAUSES OF DEATH

The causes of the 10 deaths in the series of 54 were analysed and are shown in table v.

TABLE V—CAUSES OF THE 10 DEATHS IN THE SERIES

Case	Cause of death	Time after operation
	Soon after operation—	
1	Postoperative sepsis with empyema.	4 months
2	Hæmatemesis from gastric ulcer	10 days from 1st stage
3	Bronchopneumonia	3 weeks ,, 2nd ,,
4	Bronchopneumonia	1 week ,, 1st ,,
5	Cardiorespiratory failure	1 week ,, ,, ,,
6	Doubtful	3 months ,, ,, ,,
	After discharge from hospital—	
7	Spread of disease	6 months
8	,,	5½ years
9	,,	1 year
10	Hæmoptysis, probably from same side	1½ years

Thus the immediate operative mortality is 6 (11% of the series of 54), the delayed 4 (7%) and the total 10 (18·5%). The case of hæmatemesis might be eliminated as having died from a cause outside the chest, but the operation cannot be exonerated from responsibility.

SEQUELÆ

Scoliosis.—It is difficult to prevent this deformity. In 62 radiograms examined at varying periods after thoracoplasty, concavity of the thoracic spine to the opposite side was slight or absent in 18 (29%), moderate in 27 (43·5%), advanced in 13 (21%) and greatly advanced in 4 (6·5%); a complete operation had been done in 6, 10, 8 and 4 of these cases respectively. The extent of scoliosis was assessed from the position of the curve and its angle with the vertical (slight, under 70°; moderate, 7–15°; advanced 15–30°; greatly advanced, over 30°). Probably only the greatly advanced deformity shows itself when the patient is dressed. Scoliosis may possibly aid collapse of the diseased lung by further narrowing the chest, but it has the disadvantage of increasing the reputation of the operation for deformity-production among those who may be asked to undergo it.

Lowering of vital capacity.—Very few of the quiescent cases are dyspnœic. Of 26 patients whose vital capacity was measured some time after operation, 18 had a V.C. of 2000 c.cm. or over; 1 had a V.C. of 3500 c.cm. after a six-rib thoracoplasty.

Symptomless bronchiectasis on the operated side.—Of 27 cases examined by bronchography at varying periods after the last stage, 5 showed early tuberculous bronchiectasis in the lower lobe, probably due to lobar collapse. In 2 other cases, after an interval of three years slight tubular bronchiectasis had appeared in the middle zone of one, and had become more definite in the base of the

other. Some patients (6 in this series) develop a mild saccular bronchiectasis in the upper lobe. None of these patients had symptoms of bronchiectasis when examined. It is possible, of course, that they may develop such symptoms as time goes on.

Psychological upsets.—Rarely a patient develops a feeling of inferiority after the operation and does not acquire the buoyancy which the improvement in his health would justify. Usually he was previously of a nervous temperament, was never keen on the operation, and subconsciously regards himself as deformed after it. Rather different is the patient who persists in regarding himself as in fragile health though the thoracoplasty may have been very successful; he has developed an anxiety about his health which is perhaps not remarkable after a lengthy illness.

CONTROL SERIES

The controls used are nearly all patients who refused thoracoplasty up to the end of March, 1939. The comparison is slightly favourable to them, because there were more of them in the earlier years than of patients who had thoracoplasties; some of the thoracoplasty patients, therefore, had more time in which to do badly. The distribution in years was as follows:

	THORACOPLASTIES		CONTROLS	
	Cases	and per cent.	Cases	and per cent.
1932 ..	1	(2)	0	(0)
1933 ..	7	(13)	1	(2)
1934 ..	8	(15)	5	(11·5)
1935 ..	7	(13)	10	(23)
1936 ..	11	(20)	5	(11·5)
1937 ..	6	(11)	4	(9)
1938–39	14	(26)	19	(43)
Total..	54		44	

Age-distribution is comparable in the two groups; most patients fell into the 17–25 and 26–35 age-groups. The average extent of the disease as judged by the radiogram did not seem to differ. Several cases previously recommended for operation who do not, by present standards, seem fair controls have not been included. The results in the controls are set out in table VI, and should be compared with those in table I.

TABLE VI—FINDINGS OF FOLLOW-UP INQUIRY MADE AT LEAST A YEAR AFTER THORACOPLASTY HAD BEEN ADVISED BUT REFUSED

—	All cases	Operation advised at least 3 years before
No. of cases	44	24
Dead	20 (45·5%)	14 (58%)
Going downhill ..	11 (25%)	5 (21%)
Active disease ..	6 (13·5%)	2 (8%)
Quiescent	7 (16%)	3 (13%)

Of the 7 controls now said to be quiescent 5 are reported to be working. Of these 7, 5 had cavities ranging from 1½ to 3 cm. in diameter, 1 was discharged with a partial A.P. and no obvious cavity, and 1 had no cavity and minimal disease and his sputum was negative on discharge. The controls who died after leaving hospital had lived for an average period of two years after refusing thoracoplasty.

CASES WITH SECONDARY INFECTIONS

The cases briefly considered below cannot be included in a review of tuberculous patients who have undergone thoracoplasty, because in them we are dealing not with the treatment of phthisis but with that of phthisis plus a complication.

Up to March, 1939, 8 secondarily infected empyemas were operated on; 3 of these patients are dead, 1 has active tuberculosis and a discharging sinus, 4 are fit and without active disease but still have a sinus. The pleural cavity was obliterated in none of these. Of those who died, 2 did so ten months and 1 six days after operation. Both the former developed a spread of tuberculosis in the opposite lung, and the latter had wound sepsis and presumably cardiorespiratory failure. Excluding him, an average of ten ribs were removed in each of the 8 patients. These cases help to justify the sense of discomfort felt by physicians and surgeons confronted by an empyema superimposed on tuberculosis of the lung.

One case of tuberculous empyema with active phthisis was treated by thoracoplasty. This man had a ten-rib operation and developed a pleurobronchial fistula, between stages, but is still alive 4½ years later. Thoracoplasty with removal of an unsuccessful wax inplant was performed in 2 cases; one patient's disease is arrested and he is working 6½ years afterwards. In the other an apical cavity was accidentally opened during the first stage and he died ten days later. Such an accident is not uncommon when an apicolysis has been done previously—we have had another case since—and does not depend on the skill of the operator. Thoracoplasty was carried out on 2 cases of infected extrapleural pneumothorax. One of these patients is untraced, though believed to be alive; the other died soon after the first stage from general toxæmia and sepsis with tuberculous spread to the opposite lung.

The 2 uncompleted thoracoplasties should be mentioned here; they have not been included in the body of the report because in both the intention of the surgeon was halted for reasons not deriving from the operation. One patient was considered to be psychologically unsuitable, after the first stage, and probably this conclusion should have been reached earlier; the other patient was advised to have bilateral partial thoracoplasty, but refused the second operation.

DISCUSSION

Of 54 patients with fibrocaseous tuberculosis affecting an average of over 2 lobes each, 35 (65%) have been rendered quiescent by thoracoplasty. This figure must be compared with 7 (16%) in a control series of 44 who did not have the operation. In each series most patients showed cavitation. Excluding immediate deaths, thoracoplasty apparently closed cavities in 84% of those who had had them. Unfortunately war-time conditions have prevented personal examination of the 7 controls said to be quiescent.

Of the 44 thoracoplasty cases still alive 28 (64%), and of the 35 who are quiescent 25 (71%), are known to be working. These results are good considering that before operation the patients were chronic invalids. Why are not 100% of quiescent cases at work? Undoubtedly there is a form of employment which each of them could manage—if he could find it. But often the patient has had a long period of sanatorium treatment and perhaps previous attempts to resume normal life have been interrupted by ill health. Moreover a long dorsal scar, a collapsed hemithorax and perhaps some scoliosis, however little outward deformity they produce when the patient is dressed, often make him (and sometimes his tuberculosis officer) feel that he is decidedly C3, whereas he may really be capable of quite hard work. His disability, real or supposed, cannot be kept hidden from prospective employers, who will often take back an old employee but are reluctant to engage men who are unknown to them. Colonisation would possibly be the answer, but in the most peaceful of times it cannot be provided for all.

Blood examinations (Houghton index, erythrocyte-sedimentation rate) probably act as a useful pointer to fitness for operation. In two or three cases, however, operation was indefinitely deferred because their blood seemed unduly poor, and I now feel they should have been given the benefit of thoracoplasty. In other words, though a patient should of course be made as fit as possible before operation, there may be a peak of improvement beyond which his disease will not allow him to rise, and at that point no laboratory figures should be allowed to offset the clinical indications for thoracoplasty.

The size of the original cavity did not influence the number of cases which became quiescent, though the death-rate was highest in those with the largest cavities. Of 12 patients who had a complete thoracoplasty 10 (83%) became quiescent; of 24 patients who had partial thoracoplasty only 16 (67%) became quiescent. The introduction of the Semb modification did not change the results of partial thoracoplasty for the better, but many more figures would be required to decide the value of this procedure. It is possible for a thoracoplasty case to leave hospital with positive sputum which later becomes

negative; this happened in 9 out of 13 cases, and confirms my opinion that the operation should be an incident in a period of sanatorium treatment and should not be regarded as an immediate cure in itself.

In the few examples given of thoracoplasty in complicated cases the results contrast unfavourably with those of patients who suffered from parenchymatous lung disease only.

SUMMARY

A series of 69 tuberculous patients on whom thoracoplasty was carried out at Colindale Hospital up to the end of March, 1939, is reviewed.

Of 54 patients who had parenchymatous disease only and were followed up after at least a year, 10 (18%) were dead, 2 (4%) were going down hill, 7 (13%) still had active disease and 35 (65%) were quiescent. The figures for 44 comparable controls were 45·5% dead, 25% going downhill, 13·5% with active disease and 16% quiescent.

Of 44 thoracoplasty patients still alive, 28 (64%) are now working.

No details of chest surgery are given.

The operations were performed by Mr. R. C. Brock, Mr. J. E. H. Roberts, Mr. N. R. Barrett, Mr. T. Holmes Sellors and the late Mr. H. P. Nelson. I should like to mention Dr. F. Heaf and Dr. L. E. Houghton who fostered the surgical unit at Colindale, and thank Dr. W. E. Snell, the medical superintendent, for his kind advice, Dr. W. Allen Daley, medical officer of health to the London County Council, for permission to publish this paper, and Miss L. Cornelius for her help in the follow-up.

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Reviews of Books

La thoracoplastie élective

By J. ANGIRANY, L. MICHON et A. DE MICHEAUX. Paris: Masson et Cie. Pp. 125. $1.35.

MANY modifications have been made in the operation of thoracoplasty since it passed into common use and in this work the authors put forward a clear classification of their views, based on what must always be the ideal combination—the experiences of physician and surgeon working together over several years in the same sanatorium. The importance of obtaining a selective collapse is strongly set out and the authors aim at restricting the sacrifice of ribs and conserving a maximum of healthy lung tissue. This preference for a limited operation is possibly unduly stressed, as are their objections to total thoracoplasty, which they claim leaves the patient weak and very vulnerable to any intercurrent respiratory infection attacking the healthy lung. Undoubtedly the patient who has the minimum of effective collapse is at an advantage, but the natural tendency to do too little rather than too much often leads to an indifferent result. A partial or subtotal thoracoplasty supplemented by a phrenicectomy is here advocated in place of the total operation, though it is doubtful if this course would be supported by surgeons who have experienced trouble in the small residual area of uncollapsed lung at the base. Complementary thoracoplasty—a term applied to rib resection associated with an existing pneumothorax—is regarded favourably, since any improvement produced by the pneumothorax is maintained and the shock of operation and risk of basal spread are reduced. Substitution thoracoplasties can be used to replace a contra-selective pneumothorax or may be added to an extra-pleural pneumothorax which is either incomplete or is re-expanding too rapidly. The conditions for primary thoracoplasty (thoracoplastie d'emblée) are set out in detail and the weak points in selecting the right patient and assessing the character of the disease indicated. From the variety of methods of anæsthesia discussed it is clear that the authors have not decided on a standardised technique, though their leaning is towards carefully chosen basal narcotics. They describe the technical aspects of the operation in somewhat unnecessary detail, but the postoperative complications receive well-merited attention. The main text is devoid of illustrations or statistics, but there is a well-illustrated section of case-reports, dealing rather with "problem" cases than straightforward ones.

Toracoplastias

By JORGE A. TAIANA, Buenos Aires. Pp. 89.

IN this admirably produced and illustrated monograph presented as a thesis for his doctorate, Dr. Taiana surveys the evolution and practice of thoracoplasty. Analysis of 100 cases indicates the principles applied in selecting the suitable type of case and the extent of the operation to be performed. It is significant that with increasing experience the operative mortality shows a distinct drop—presumably owing to a more accurate selection of cases rather than to improvement in technique. Careful clinical and radiological investigation are essential, and the author also places considerable reliance on attempts to estimate the functional capacity of the lungs before operation; in the absence of a more simple method, he recommends bronchospirometry as introduced by Jacobæus as the most satisfactory procedure. Tomography which in this country is usually reserved for exceptional cases is used freely since Dr. Taiana holds that it enables the diseased area to be more accurately studied than does any other method and that it facilitates the planning of the operation. He also brings out the value of small preoperative blood-transfusions. He has carefully studied the method of action of thoracoplasty on the lung and shows that two main forms are now in use. The operation commonly practised aims at obtaining collapse of such a degree that the size of the affected area is reduced, immobility is obtained and mechanical strains relieved. In the other category are the new, more experimental, "elastic" operations which aim at encouraging healthy atelectatic lung—round a cavity, for example—to re-expand, fill in areas where tissue has been lost and compensate for the cicatrising effect of healing lesions. The failure of thoracoplasty to achieve its desired effect in some cases justifies the consideration of such other methods as drainage of cavities, obstruction of bronchi, excision of lung and so on. These ancillary procedures are in fact being given a good trial in many clinics.

As a review of the development and present position of thoracoplasty this monograph makes excellent reading.

General Bacteriology

By D. B. SWINGLE, professor of bacteriology and dean of the division of science, Montana State College. London: Chapman and Hall. Pp. 313. 16*s*.

IS bacteriology a branch of biological science or is it a mere tool for other sciences without any real status of its own? The answer to this question in the preface to this book would almost certainly be that at least nine out of ten practitioners and teachers alike think of bacteriology only as a convenient means to diagnosis. Professor Swingle is first and all the time a biologist, so that his point of view is wide; he has the American gift of orienting his subject to its broadest issues, and can write about life in relation to other life without bothering too much about the infinitesimal part of bacteriology which covers human disease. The student who masters this book will not be able to repeat the details of the Wassermann test but he will be able to follow intelligently any antigen-antibody reaction. He will learn easily and with pleasure much about the bacteriology of soil, milk, food and water, and how bacteria can be trained in commerce to do a specific and highly complicated job of organic chemistry. The author thinks that students should be biologists before tackling specialised lines like medical bacteriology; and our own medical curriculum does lip-service to this belief by supplying a small antigenic dose of biology before the student is swamped in other work. It is doubtful whether beginners in this country will respond to Professor Swingle's defence of classifications: it is well to know that blue-green algæ are the bacteria's nearest relatives but it is not so easy to remember whether a yeast belongs to the genus zygo or schizosaccharomyces.

THE LANCET

LONDON: SATURDAY, MAY 31, 1941

FRIENDLY FOREIGN DOCTORS

THE debate in Parliament on May 13[1] may do something to clear the air in regard to the difficulties which have arisen in making full and rapid use of the medical men and women from enemy and occupied countries who have sought refuge with us. It was clear that some of the speakers had an imperfect understanding of all the ramifications of this problem. Even the reply by Miss HORSBURGH, parliamentary secretary to the Ministry of Health, left some of them unexplained. Laymen might be excused for suspecting that professional obstruction was causing the delay, since it is true that the British Medical Association resisted, in the pre-war years, a too free absorption of refugee practitioners coming to this country with the object of acquiring British qualifications and gaining complete and permanent freedom to practise medicine here; and even then the leaders of the association had difficulty in convincing the rank and file of the profession that they had not yielded too much. It is equally true, however, that the Central Medical War Committee was urging the employment of foreign practitioners on the Government long before the regulations were made which authorised their employment and before the Robinson Committee specifically recommended it. The suggestion, therefore, by medical Members of Parliament that some of the delay might be attributed to an unsympathetic attitude on the part of the central committee was not justifiable.

It is regrettable that the absorption of foreign practitioners, once it became possible, should have been so slow. Even the Ministry's figures seem to be tentative and provisional, but it appears to have been admitted that the number of such practitioners in the country is about 1350, and that not more, and probably less, than 200–250 had been placed after four months' endeavour.[2] By that time, however, the machine had begun to work smoothly and 100–150 are now being passed through each week. There is still room for acceleration, but, as Miss Horsburgh pointed out, no part of the "vetting" of foreign applicants is dispensable. They must be acceptable to the employing body, they must be placed where they are really needed, their qualifications must be satisfactory, their proficiency in the English language must be adequate (despite rather flippant parliamentary remarks on this subject) and their loyalty to the Allied cause must be beyond question. Different authorities are, and must be, concerned with these requirements, and it is not necessarily a waste of time that one of them, the Central Medical War Committee, should act as a clearing house for the others. The procrastination has occurred in the operation of the machine. The circular (No. 2312) of the Ministry of Health giving sanction to the employment of such medical men and women in hospitals was not issued until March 17. Hospital authorities were not immediately convinced that these doctors would be acceptable, especially when their engagement might entail the removal of some of their existing and experienced British doctors to the fighting services. When they did take steps they found to their consternation that a post they had hoped to fill quickly must remain vacant for as long as two months before the practitioner was finally approved at the centre. It was pointed out in the debate that the delay was mainly at the Home Office, where the credentials of the doctor as an alien are looked into, but it was cogently remarked that everything that the Home Office could by any means ascertain should already have been known to them, since most of these men and women had already been in our midst for a long time. The truth appears to be that the Home Office is not the only Government department concerned, and that the blockage occurs in another office which already has an unenviable reputation in this respect, and which was not mentioned in Parliament. Another difficulty which was ignored has arisen from the fixed proportion of foreign doctors to total staff which may be allowed in any one institution. At first sight it seems reasonable that not more than ten per cent. of the medical staff should be aliens in hospitals over 100 beds in size and not more than twenty per cent. in smaller hospitals, these being the proportions laid down in the Ministry's circular. But many special hospitals, which have even greater staffing difficulties than general hospitals, carry a small number of medical officers in proportion to their bed accommodation. They seldom have the five or ten doctors necessary, if their accommodation is respectively under or over 100 beds, before the employment of even one foreign doctor is permissible. For instance, a large tuberculosis organisation controlling nearly 2000 institutional beds has not one institution which could comply with the Ministry's requirements, and is yet anxious to give employment to doctors from abroad. It seems reasonable that such an organisation should be regarded as a simple unit for this purpose, provided that there are sufficient safeguards against excessive staffing with foreign doctors in any one institution.

When all these impediments have been overcome there still remains the fact that doctoring on the continent of Europe is not just the same as it is here, a fact brought out by Prof. M. GREENWOOD on p. 706. The training and experience of foreign practitioners may be better or worse than ours but it is different; and they are accustomed to deal with people with other traditions and outlook. Many of them have specialised in a way which would not qualify them to rank as specialists in this country, but has nevertheless unfitted them to cope immediately with the general work expected of a resident medical officer in a general hospital. Some time must elapse before they can pull their full weight in the posts now open to them. It would be foolish, on the strength of one or two exceptional instances known to members of Parliament, for anyone to suppose that British-trained doctors can be replaced straight away, and on a large scale, by foreign ones without at least a temporary loss of efficiency. Hospitals are ready, however, to make the necessary adjustments as soon as the machinery for recruitment is tightened up.

1. See *Lancet*, May 24, 1941, p. 678.
2. In his address opening the G.M.C. session on May 27 the President said that there are now 294 names on the temporary register of practitioners from the Empire, the U.S.A., and Allied and enemy European countries.

THE SCOPE OF THORACOPLASTY

MANY physicians are still reluctant to submit their patients with pulmonary tuberculosis to an operation that they regard as being both dangerous and mutilating, but thoracoplasty has nevertheless become established as the mainstay of active treatment for cases in which pneumothorax or any of its allied intrapleural manœuvres have failed to bring about the desired result. A general survey was given by Mr. BRUCE DICK in a Honyman Gillespie lecture reported later. On another page Dr. HURFORD records the results of 69 thoracoplasties performed at Colindale Hospital between 1933 and 1939, and gives a detailed review of the 54 patients suffering from parenchymatous disease. The follow-up was made at least a year after the last stage and the results show that 65% were then quiescent, 13% still had active disease, 4% were going downhill and 18% had died (6 out of the 10 deaths occurred immediately or soon after operation). Of the 44 patients known to be alive a year after the operation, 65% were working, including 2 patients with active disease. A control series of 44 patients in whom thoracoplasty was advised but refused revealed 16% with quiescent disease, while 46% had died. HURFORD'S figures show that thoracoplasty performed by skilled hands on patients who have been expertly selected for the operation does not carry such a terrifying mortality as many people have supposed.

The type of disease requiring collapse or relaxation therapy varies within wide limits. It embraces, at one end of the scale, a patient with acute fulminating phthisis in whose interests even the artificial pneumothorax needle should be used with the utmost caution, and at the other extreme the robust and healthy looking consumptive who has satisfied the criteria for constitutional quiescence, but whose cavity is still patent and whose sputum remains positive. Artificial pneumothorax holds and will continue to hold a pre-eminent position in the control of recent disease and in cases where the pleural cavity is free from adhesions. It is for the chronic fibroid and adherent type of phthisis that thoracoplasty has hitherto been reserved, and operation is usually withheld until all evidence of activity has been excluded. May it not be that in many such patients the operation is performed too late and that too much is expected of it? It is hard to see how even a well-planned and extensive thoracoplasty can bring about firm healing of a thick-walled fibrotic cavity. It can deform it and convert it from a sphere into a slit, but so far there is scanty evidence that complete and permanent healing has resulted. The post-mortem material for this research is not often obtained and only from this aspect can we determine the full success of the operation. Collapse of both healthy and diseased tissue is the basis on which thoracoplasty is founded, and this principle has been aimed at in the standard operations. There is, however, another aspect which has been given recent prominence in the works of such authorities as CORYLLOS and MONALDI, and is further noted in two monographs reviewed in this issue. It is the possibility of utilising healthy but atelectatic lung in the process of healing. The space which constitutes a tuberculous cavity does not always represent the actual amount of tissue lost; distension and centrifugal traction may account for much of its size, and as a result the cavity wall may contain a good deal of collapsed but otherwise normal lung tissue. If these "dynamic" effects can be relieved, the healthy tissue will re-expand and occupy some of the space lost by ulceration and will compensate for the shrinkage that occurs in the normal healing process of fibrosis. The "static" effects which are the result of complete and final cicatrisation and sclerosis cannot be compensated for in this way, and require the more usual form of thoracoplasty rather than an elastic procedure which might succeed in the dynamic type of lesion. If this distinction could be made clinically, it is possible that an increased field for surgery would be provided, but there are obvious difficulties. ANGIRANY and his colleagues stress the value of kymography in detecting the degree of movement among the tissues in the diseased area, while TAIANA has found that extensive use of tomography helps to assess the extent and condition of the lesions.

In any operation on a tuberculous patient there is always the possibility of flaring up a hitherto quiescent focus or an unsuspected active lesion, and most of the attention in selecting suitable patients is directed towards making sure that any active or exudative element is minimal. Extrapleural pneumothorax, when it was revived a few years ago, was regarded as a potential bridge over the gap between acute and chronic disease. It was worthy of the extended trial that has been given it, and, even though it has been found wanting in many respects owing to various complications, it has led to some relaxation of the rigid rules that governed the selection of cases for thoracoplasty and widened the scope of the latter. The problem of assessing activity cannot always be settled today by the most careful clinical and radiological examination. Detailed study of the blood picture (including the differential white-cell count, von Bonsdorf count and sedimentation-rate), as advocated by HOUGHTON, has a definite value and might well be given a wider application. Thoracoplasty can only be used to combat the earlier type of disease if we can forecast with stricter accuracy which patient is likely to go wrong. This will tax to the utmost our clinical acumen and all our laboratory resources, but the collating of all forms of evidence may enable the student of constitutional medicine to point out the safe way.

THE NATIONAL LOAF

IN its first memorandum on bread[1] the accessory food factors committee of the Lister Institute and Medical Research Council advocated the use of wheat flour in which 80–85% of the grain was extracted instead of the usual 70–75% as a step to improve the health of the nation, and they also recommended that calcium should be added to bread. The Government adopted the second recommendation but not the first and announced their decision to fortify white flour with vitamin B_1 and calcium. A year has passed but the bakers have still not received from the millers flour containing either added vitamin B_1 or calcium and there seems no certainty when they will. Meanwhile the Government, without much enthusiasm, have adopted a loaf baked from 85% extraction flour without added calcium as the national loaf and

1. See *Lancet*, 1940, **2**, 143.

are encouraging us to eat it. But they have not explained the situation, and the public are inclined to suspect that some sort of war-time substitute is being offered them. Few people have grasped that the national loaf is probably the best bread, judged on its food value, that they have ever eaten, for it has been selected after a most careful scrutiny of the nutritive value of the different parts of the wheat grain. In milling white flour 70–75% of the grain is used, leaving at least 25% of the grain not normally used for human food. If we are going to eat 85% of the grain we are going to eat another 10 parts out of the usually unconsumed 25 parts, but obviously we have a choice as to which 10 parts we choose, and it is on the choice of these 10 parts that great care has been lavished. On another page is published a second memo on bread from the M.R.C. in which the parts of the grain to be included in the 85% extraction flour are defined in detail, and we are told the reasons for the choice.

These reasons were not all nutritional; the æsthetic one of providing the whitest possible loaf compatible with nutritive excellence was never lost sight of. "The loaf is cream coloured and brings you the cream of the wheat" might be used as a slogan to express the ideal of the Ministry of Food's advisers in their wish to comply with what is believed to be the prevailing popular taste. The digestibility of the loaf also received attention, and a low content of fibre or so-called roughage, not more than half that of wholemeal, was fixed so that delicate digestive tracts should not be irritated. In 85% flour, as defined in the memo, the purely nutritive advantages which are undisputed are the higher content of vitamin B_1, of the vitamin-B_2 complex, of iron, and of protein of good quality. There is one admitted drawback: the browner the flour the more it contains of phytic acid and its derivatives, whose action is to precipitate and make unusable not only the scanty calcium in the bread itself but also that in the rest of the diet. There is little of these substances in white flour; in 85% extraction flour there is a good deal more but only about half as much as in wholemeal. It was because of the extra phytic acid that the M.R.C. committee originally advocated the addition of calcium to the 85% flour which they were recommending. Most dietitians agree that it would be a good thing to add calcium to white flour, since there is an insufficiency of calcium in small-income diets containing much bread, but the reason for adding it to higher extraction flours is much more cogent, and there can be no serious argument against it from the trade since the millers are already in the habit of "improving" the baking properties of flour by adding acid calcium phosphate in about the same amount as it is now recommended to add calcium carbonate. In self-raising flour the amount of calcium salt habitually added is much greater.

When the M.R.C.'s new memo has been read, the reader is left wondering why the policy of fortifying white bread with vitamin B_1 should still be pursued by the Government. The arguments for adopting 85% extraction flour with added calcium for universal consumption as soon as present stocks of white flour are exhausted seem overwhelming. Both the national (85%) loaf and a fortified white one promise extra vitamins but the national loaf provides others besides B_1. Further, the supply of protein in our present diet is meagre, and the opportunity to introduce more protein of better quality by a simple change in our most widely used foodstuff should not be missed. Lastly there is the need of shipping space. In the last war this imperative necessity drove the extraction of flour to 95%; a general advance to 85% now would afford an appreciable relief. Against the change can only be set popular prejudice (much of which will go when everyone has sampled the national loaf), the better keeping qualities of white flour, and an understandable reluctance to scrap the machinery which is now producing vitamin B_1 cheaply and on a large scale.

Annotations

A GERMAN WAY OF DETECTING METALLIC FOREIGN BODIES

On May 16 a speaker on the German radio described a new device by which, he claimed, bullets, shell splinters, needles and other metal objects can be readily located. This metal-finder, developed by the firm of Siemens and their medical advisers, depends on the use of a high-frequency oscillator of small intensity. The tuning coil of a small short-wave transmitter is fitted into a sterilisable porcelain probe, 10 cm. long and 10 mm. in diameter; if this coil approaches a metallic substance—such as a splinter in the operation area—the inductance of the coil will change, and hence so will the frequency of the transmitter. The change of frequency, which may be very minute, can be made audible by combining these oscillations with those of a second short-wave transmitter oscillating at a slightly different frequency, and so obtaining oscillations at the beat frequency, amplifying them and passing them to a loud-speaker. The apparatus has an equally good reaction to all metals, including the large group of light metals now being increasingly used which cannot be located by magnetism. It is also extremely sensitive and can trace the minutest particles. Tests carried out during more than a hundred operations have proved its worth, and so far it has never failed, even in such delicate cases as the localisation of a sewing needle in the lungs or a splinter the size of a pin's head in the knee-joint. On the contrary "such difficult operations can only be attempted with the hope of certain success," said the broadcaster, "with the aid of the metal-finder." The apparatus is so sensitive that all metal instruments within a 10 cm. radius must be removed while the probe is in use; porcelain towel-clips have therefore been introduced and have proved satisfactory. The Germans are hoping to begin distribution of the apparatus to hospitals and field hospitals within the next few months.

THE STORED BLOOD-CELL

The increasing use of blood-derivatives as transfusion fluids makes it necessary to keep in mind that none of them has all the therapeutic properties of fresh blood. To carry oxygen red blood-cells still capable of functioning are needed. It is now generally admitted that the cells of stored blood deteriorate with age, and that as Whitby [1] puts it their survival-time in the recipient is a function of their fragility This does not mean that blood stored for seven or eight weeks may not be used in an emergency, for such blood has often been given with benefit, though it has also produced reactions. The real question is how long blood can be stored and still retain a large part of its therapeutic value without becoming at the same time risky to administer. Crosbie and Scarborough [2] have studied the progressive spherocytosis and the individual variations in blood during

1. Whitby, L. E. H. *Proc. R. Soc. Med.* March, 1941, p. 257.
2. Crosbie, A. and Scarborough, H. *Edinb. med. J.* April, 1941, p. 253.

storage and in the main agree with earlier workers as to the time of the stored erythrocyte's change of life. The final test, however, is to watch the behaviour of the stored cells in vivo, and we have already noted [3] how this may be done with the ABO and MN factors. This method has been used several times; Mollison and Young,[4] for example, have followed the fate of 26 transfusions given to 20 patients and estimated the number and nature of donor cells by differential agglutination. They conclude that a high proportion of cells stored in the standard glucose-citrate-saline solution up to 18 days survive in the recipient probably as long as do fresh cells; if the blood is 20 days or more old cell destruction in the recipient is more rapid, though a diminished number of cells still survive for many days or even weeks.[5] With blood seven or eight weeks old jaundice is fairly common. A. S. Weiner's much-quoted view that a day in the ice-chest is equivalent to six in the blood-stream is probably exaggerated. It seems, then, that most of the laboratory and clinical evidence supports the three-weeks time-limit for storage; we can be reasonably sure that blood stored for less than this time will not cause either more or more severe reactions than fresh blood, nor will its therapeutic properties be seriously impaired.

UNRECOGNISED CYSTICERCOSIS

MACARTHUR has held for some years [6] that cysticercus cellulosæ, the larva of the tapeworm *Tænia solium*, is commoner in Britain and has more serious effects on man than has been suspected. He early noted that in the Army about 100 new cases of epilepsy were occurring annually in men stationed abroad who had previously been well and came of healthy stock. Moreover, occasional cysticercus infections had been reported, and all the men so affected had this type of epileptic history. It was arranged that all epileptic cases among soldiers should be admitted to Millbank Hospital and MacArthur found,[7] among 22 consecutive admissions for epilepsy, that cysticercus cysts were present in 12. In addition to fits, the patients showed paralyses and mental disturbances ranging from a tendency to "act silly" to acute mania, melancholia, delusional insanity and dementia præcox.[8] MacArthur's suggestion that a search of hospitals and other institutions would reveal hundreds of infections was received with scepticism; yet his own control investigations,[9] made on fleeting visits to mental hospitals, disclosed several unsuspected cysticercus infections and add weight to his suspicion that many more would be revealed by a systematic search such as he has in mind. Patients with a good family history who had developed epilepsy in adult life, after service or residence abroad, would have to be submitted to X-ray examination of the whole body at intervals over a period of years. MacArthur finds that while these parasites live they may harm their host little. This is confirmed by Evans,[10] who has published radiograms showing hundreds of calcified cysts in the muscles of the thigh, arm and shoulder of a man who, after three days in hospital following a fit, attended the Highland games at Crieff and took second place in the long jump. When cysts die they absorb fluid from the host's tissues, increase in size and if they lie in the brain cause increasing damage. In a cyst which lies near the surface the tenseness can be felt, and the fluid and scolex are ejected forcibly when it is opened. When cysts are present in large numbers a temporary diffuse swelling of the affected muscles appears which give to a spare man the aspect of a professional weight-lifter. Death and swelling bring new cysts to light from time to time. After death the scolex alone or the whole cyst wall may calcify; and only then does the radiogram take its place in diagnosis. Eosinophilia is not helpful in the established disease. Even when nothing can be done for the patient it is important to establish the diagnosis. If the epileptic has children it relieves his fear that they will suffer from a hereditary taint. It also takes his illness out of the category of "constitutional" (in which true epilepsy is classed) into one attributable to military service, so that he is no longer in danger of losing his few shillings of reservist pay. The oftener these infections are recognised the greater is the opportunity to estimate the effects of parasiticidal treatment. This is not easy, because whether treated or not most surface cysts disappear in time, sometimes rapidly, with or without calcification; thus there is often a stage—before another set of the cysts already in the body swell up—in which there is no evidence of the infection. A drug to be safe must kill the parasite without causing its distension, and this does not seem an impossible hope seeing that many men with advanced infections have never been ill or missed a game of hockey or football. There is no good evidence that the cysticercus is necessarily introduced into the body by auto-infection; most patients give no history of having harboured a tapeworm. The eastern custom of using human manure in the growing of vegetables is suspected of providing a source, but there is also evidence that ascaris and oxyuris eggs may be air-borne. The onchosphere's ample coating suggests that the egg is well fitted to withstand drying while blowing about in the dust. The last annual report on the health of the Army in India contains only one record of epileptiform fits associated with cysticercus infection; it would be valuable to know whether this fall in incidence has followed special hygiene or prophylaxis. In the last 7 years this syndrome has been reported from Peiping, Singapore and Madras, and a thorough search might well reveal cases among our own general public.

THE MIND OF THE CRETIN

AT one time it was believed that if a cretin was given adequate quantities of thyroid early enough his mental and physical development would be normal. Then the pendulum swung over, and it was generally held that, though physical development might be normal as long as the patient was getting thyroid, normal mental growth was seldom, if ever, attained. Goodkind and Higgins,[1] of Boston, having under their care twenty-three cretins who had been receiving thyroid for periods ranging from 5½ to 24 years, decided to settle this question. To prove thyroid deficiency, the thyroid treatment of twenty-one of the patients was omitted for 8 weeks; the blood-cholesterol and basal metabolism were estimated after 4 weeks and again at the end of the 8-week period. In most patients these laboratory tests demonstrated hypothyroidism after 4 weeks and in all after 8 weeks. The blood-cholesterol level is well established as an index of thyroid insufficiency, hypothyroidism being accompanied by hypercholesterolæmia. They were able to show a close correlation between blood-cholesterol levels and basal metabolic rates, thus establishing that either test may be accepted as a convenient measure of thyroid function. They grouped their patients according to their intelligence quotients (thyroid was being given at the time of the tests) and found that six had normal intelligence, four of these having an I.Q. above 100; six were of low normal intelligence with I.Q.s between 72 and 87; and eleven were retarded, with I.Q.s below 70. Thus the analysis shows that normal mentality can and does occur in a fair proportion of treated cretins, and it would be natural to suppose

3. See *Lancet*, 1939, **2**, 1326.
4. Mollison, P. L. and Young, I. M. *Quart. J. exp. Physiol.* 1940, **30**, 313.
5. Mollison and Young, *Lancet*, 1941, **1**, 420.
6. MacArthur, W. P. *Trans. R. Soc. trop. Med. Hyg.* 1933, **26**, 525.
7. *Ibid*, 1933, **27**, 326.
8. *Ibid*, 1934, **27**, 343.
9. *Brit. J. Radiol.* May, 1941, p. 183.
10. Evans, R. A. *Trans. R. Soc. trop. Med. Hyg.* 1939, **32**, 549.

1. Goodkind, R. P. and Higgins, H. L. *New Engl. J. Med.* April 24, 1941, p. 722.

that the fortunate ones were diagnosed and treated early; Goodkind and Higgins shatter this notion. The age of the beginning of treatment was earlier, on the whole, in those with retarded intelligence than in those who were mentally normal. This can be partly explained by another of their findings—that the degree of mental defect does not correspond to the degree of thyroid deficiency as measured by the dose of thyroid needed to maintain normal metabolism. Severe mental defect is likely to be noticed earlier than the insidious physical characteristics of cretinism. Physical growth was found to bear a rough relation to mental development: the mean I.Q. was higher in the eleven patients with normal physical growth than in the twelve dwarfs in the series, but three of the dwarf group had I.Q.s above 87 and five of normal size were mentally retarded. In other words, the mental defect is not due to the thyroid lack but is congenital, and probably produced by the same cause as the athyria. Thus thyroid, though it may be expected to quicken the mental processes of a cretin, cannot make good the coexisting mental defect. There is nothing new in this conception, which indeed has long been accepted; but the inquiry has cleared the ground and established finally that congenital mental defect is not an essential part of cretinism.

Another important fact emerged. One patient in the series was found to be no longer a cretin at the time of the study. Three years before his basal metabolism had dropped from +10 to −21% after 56 days without thyroid; at the time of the study thyroid was withdrawn for 7 months without inducing any change in his normal basal metabolism and blood-cholesterol. This seems to dispose of the old saying: "Once a cretin always a cretin."

JUGULAR COMPRESSION IN DIAGNOSIS

COUGHING and straining have long been known to exaggerate motor, sensory and sphincter functions in patients with spinal-cord tumours and other spinal lesions, and ventriculography sometimes leaves the patient who has internal hydrocephalus resulting from a tumour with exaggerated symptoms. These effects are due, respectively, to raising and lowering the pressure above the lesion, the change in equilibrium causing local distortion, and consequently fresh signs and even catastrophe. These observations are the basis of the jugular-compression test, which can be performed manually, or, with more control, by means of a sphygmomanometer cuff about the neck. Naffziger and Jones[1] used manual compression of the jugulars to differentiate spinal root pain caused by tumours (such as neoplasm or herniated intervertebral disc) from that produced by other, non-mechanical, lesions. Dr. R. B. Aird, addressing the American Neurological Association[2] reported on the use of compression by the cuff in a series of 100 patients with neurological disorders, throwing new light on the uses and limitations of the test. The cuff can be applied with the patient either sitting or lying prone; the advantage of the prone rather than the supine position is not explained. The patient is assured that the test is harmless and painless, and the pressure is then raised to 40 mm. Hg and maintained at that level for 10 minutes. During that time the examiner, who of course must be closely familiar with the neurological findings before the test, must examine the nervous system thoroughly, noting any new signs and any change in signs already present. Significant changes are likely to appear late in the period of compression. When the compression is released the nervous signs should be checked again; responses return quickly to their original level and Aird finds that the recovery changes are often even more convincing than those elicited during compression. The test was regarded as giving a positive result when it caused exaggeration of some sign or symptom already present or produced some new sign or symptom. In his 100 cases there were 45 space-occupying lesions (tumours of the brain, tumours of the spinal cord and herniations of the intervertebral discs); in 41 of these the compression test gave positive results. There were 28 cases in which tumours had been suspected but disproved, and in all of these the results were negative. Among 27 cases without tumours (degenerative diseases 6, convulsive states 12, post-traumatic head syndrome 8, and acute cerebral concussion 1) only one positive result was obtained, and that was in the case of acute cerebral concussion. Aird warns against accepting negative results as valid on the basis of this series. Only proved and disproved cases of tumour were included; in doubtful cases it may well be that signs too slight to establish a diagnosis may also be too slight to give a positive response to the test. As signs become more pronounced with the progress of the disease the test may also become positive. He reports 2 cases in which the test was of great service to the patient. In one, a student with a cerebral tumour blocking the foramen of Monro, the jugular compression test alone established the site of the tumour—an oligodendroglioma which was successfully removed. In the second case the test disposed of a diagnosis of cholecystitis and established the diagnosis of spinal tumour, and the level at which it was found. The signs likely to be accentuated or produced by the test are facial paresis, asymmetry of deep reflexes, visual-field defects, abnormal reflexes, paresis, nystagmus, inequality of pupils, hypo-æsthesia and aphasia. Aird considers the dangers negligible, except in patients with suspected tumour of the brain-stem or posterior fossa who are always in danger from the effects of sudden strain. In the discussion following Aird's paper Dr. J. B. Ayer doubted the safety of the test also in cases of aneurysm, hæmangioma or advanced vascular degeneration. Aird, however, considers that these are not contra-indications, since the change in pressure occurs only in the venous and extra-arterial spaces and is too low to approach even the lowest pressures in the arterial system. As changes in intracranial pressure are universally propagated through the cranium, the test is not likely to be of value in supratentorial tumours which have not caused internal hydrocephalus, but when used with caution it may throw a little light on the exact anatomical diagnosis of brain-stem or spinal-cord lesions.

1. Naffziger, H. C. and Jones, O.W. *Arch. Neurol. Psychiat.* 1935, **33**, 941.
2. Aird, R. B. *Ibid*, April, p. 633.

THE RIGHT AMOUNT OF FLUORINE

THE distribution of endemic human fluorosis is being studied closely in Great Britain.[1] Badger has noted[2] that endemic fluorosis is found in at least 25 of the United States, and that clinical human fluorosis has spread beyond endemic areas, owing to the increasing use of fluorine in sprays used on agricultural pests attacking foodstuffs. He thinks fluorosis is becoming a problem not only for the dentist and public-health worker but for the general practitioner and the pædiatrician. A further study of domestic water and dental caries has been made by Dean and his colleagues[3] on 2832 children between the ages of 12 and 14 in eight communities in the suburbs of Chicago; this showed the usual low rate of dental caries associated with the use of fluoride waters. The fluorine content in such waters was low, approaching only the minimum threshold for mottled enamel; at such levels stained teeth as an æsthetic problem did not arise. There is no cure for dental mottling due to fluorosis, since the enamel-forming cells cease to function when calcification is complete. Prevention must depend largely on an altered water-supply.

1. Wilson, D. C. *Lancet*, Feb. 15, 1941, p. 211; see also p. 216.
2. Badger, D. C. Supplement to the Practitioner's Library of Medicine and Surgery, London, 1940, chap. 28.
3. Dean, H. T., Jay, P., Arnold, F. A. and Elvove, E. *Publ. Hlth Rep., Wash.* **56**, 761.

In an endemic area local wells may contain much fluorine while water from lakes and rivers is often free. The fluorine content of a water-supply can be diluted until it lies below the minimum level for mottling (1 part per million of fluorine). Distilled or cistern waters are free from fluorine, and it can also be filtered out cheaply and effectively through calcined bones. Observers in various parts of the world have noted the apatite in igneous rocks as a source of fluorine, but the fluorine inquiry [4] undertaken in the United Kingdom by the Geological Survey (as part of a war-time study of underground sources of water) is probably the first attempt to determine the source of fluorine in sedimentary rocks with a view to preventing fluorosis. Attention has hitherto been largely centred on the toxic manifestations which follow excessive absorption of fluorine. But the optimum intake, which is possibly more important, has not yet been determined. There seems to be no doubt that fluorine protects against dental caries; Dean and others in America [5] and Wilson [6] in England have shown that in areas where fluorine is known to be present in the rocks the inhabitants show a relative immunity to dental caries apart from the presence of mottled enamel. Bromehead [4] has described apatite as one of the chief accessory minerals composing the Island of Lewis, where the excellence of children's teeth has been reported by King.[7] Adequate amounts of fluorine may thus be valuable in the diet of growing children, but nobody knows how much they are getting now. The distribution of fluorine in English foodstuffs has not yet been studied by modern methods—we do not even know the distribution of fluorine in different parts of grain, an important point in view of the demineralisation produced by the higher grades of milling.

TRICHINIASIS IN ANIMALS AND MAN

ALTHOUGH trichiniasis is not uncommon in the United States and in Germany and Poland, there have been very few recorded cases or outbreaks in Great Britain. Since the end of last year, however, over 200 cases have been reported, with epidemic incidence in Wolverhampton and district, around Penrith and in Birmingham. Dr. Paul B. Beeson, of Harvard, speaking at the Royal Society of Medicine on May 23, said that many animals, including the cat, dog and pig are naturally susceptible to trichiniasis. In America, trichiniasis in the pig has been as high as 5% in large cities where the pigs are fed on unboiled garbage and swill. Boiling the garbage, which has been a legal obligation in this country only since 1932, largely prevents pig trichiniasis. Infestation of rats is endemic in certain parts of this country—Professor Leiper said later that 25% of London rats are infested—and pigs are probably occasionally infected from eating rat-carcases, but more commonly from eating raw scraps of infested pork. Infection is not transmitted by fæces. Infection of man from pork can be prevented by heating the meat at 60° C., by refrigeration at −15° C. for 20 days or by brine-curing; refrigeration at 0° C. must be continued for several months to be effective. After they have penetrated the intestinal wall of a human host the growing trichinella larvæ become arrested in the muscle capillaries and encyst themselves; they may survive for 15–20 years in skeletal muscle. The classical clinical features are fever, œdema of the eyes, muscle-pains and eosinophilia, but in Dr. Beeson's view the syndrome probably indicates an uncommon and severe form of the infection; there must be many mild and latent infections which could be detected either by a differential blood-count or by the more specific immunological tests. Of these the skin-test is most easily applicable. Working with Colonel Cecil Maddock of the Ministry of Health, he has made a recent survey in which 101 known contacts of trichiniasis cases were skin-tested: 12 gave positive reactions. Of these, 9 gave a history of a recent mild influenza-like attack with fatigue, malaise and aches in the limbs. This finding, together with the American records which show that only 600 clinical cases are reported annually although autopsy surveys give incidences varying from 3 to 27%, proves that patients with the classical syndrome constitute only a small fraction of those affected. The clinical manifestations of infection in a community will depend partly on the size of the infecting dose, which, since the worm cannot go on reproducing itself in the same host, is limited by the number of larvæ ingested. They also depend on the susceptibility of the population; there is a natural resistance to infection, so that of 6 men eating infected pork, 1 will develop the classical syndrome, 1 will have a mild attack like influenza and 4 will become latently infected. But if there is no acquired resistance from previous latent or clinical infection—and one attack usually confers immunity—a susceptible population suddenly exposed to the risk of infection will produce a high incidence of clinical cases. The recent epidemics in this country can be explained in several ways: owing to war-time restrictions the older sows (which are much more likely to have been infected from eating rat-carcases because greater age means greater opportunity) have been killed to make sausages; then, a smaller percentage of meat in the sausage has meant more infected sausages; and finally the sausages have been eaten, either raw or insufficiently cooked, by a highly susceptible population.

Prof. R. T. Leiper, who has been organising research into the agricultural side of the problem, told the meeting that in Wolverhampton 2 out of 149 rats examined were infected, in Penrith 9 out of 194 and in Pembrokeshire none out of 19. Infection has also been demonstrated in the cat; and incidence in cats may prove to be a good indicator of endemic infection among rats. German statistics show about 2% of trichiniasis among pigs, sows being more commonly affected than hogs. (Dr. Beeson remarked that American figures did not show any sex predilection in man.) Miss M. Young had examined the diaphragms of over 4000 pigs from suspected areas with negative results; but in 47 human autopsies recent or long-standing infections had been found in 6; these cases came from the Wolverhampton or Birmingham districts. Studies in other areas are being arranged. Miss Phyllis Clapham thought it unwise to regard a 7-day incubation period in man as being constant because of the different rate of development of larvæ in different hosts. Mr. J. W. G. Leiper described the high but transient eosinophilia which follows experimental infection in the pig, and Mr. W. P. Rogers mentioned the increased creatinine excretion in infested animals which might have practical applications.

4. Bromehead, C. N. *Lancet*, May 24, p. 673.
5. Dean, Jay, Arnold, McClure, F. J. and Elvove, *Publ. Hlth Rep. Wash.* 1939, **54**, 862.
6. *Lancet*, March 22, 1941, p. 375.
7. King, J. D. *Lancet*, 1938, **2**, 109; *Spec. Rep. Ser. med. Res. Coun., Lond.* 1940, No. 241.

Prof. J. A. RYLE has been appointed consultant adviser in medicine to the Minister of Health for the Emergency Hospital and Medical Services. Dr. N. M. GOODMAN and Dr. V. D. ALLISON, medical officers of the Ministry of Health, have been appointed deputy senior medical officers.

Mr. R. H. P. ORDE, who died on Saturday last, at the age of 74, was a doughty champion of the voluntary hospital principle. Soundly trained in hospital management in London and Newcastle-on-Tyne, he learned, with Sir Napier Burnett, the elements of a wider coöperation under the Red Cross, and was Lord Sankey's right hand in setting up a voluntary hospitals commission. Without the central bureau which he founded and directed, the voluntary hospitals of this country might have continued to plough lonely furrows until it was too late to combine.

Special Articles

NATIONAL FLOUR

A SECOND MEMORANDUM

IN a memorandum last summer[1] the accessory food factors committee of the Lister Institute and the Medical Research Council made the following recommendation:

"Flour for the bread of the people should contain the germ of the wheat grain, as much as possible of the aleurone layer, and the finer portions of the bran. Instead of flour consisting of about 70% of the wheat grain, as it does at present, the percentage extracted should be at least 80–85%."

Since then the Ministry of Food has decided to make generally available to the public bread baked from flour of 85% extraction. In the original memorandum the nutritional considerations on which the recommendation was based were set out. A second memo issued on May 22 restates them, incorporating the results of further research and defining more exactly the character of the particular 85% extraction flour recommended.

The degree of extraction was fixed at 85% in order to secure a flour which should contain:

As much as possible of the B vitamins, including riboflavin and nicotinic acid, and especially of vitamin B_1, present in the whole wheat.

As much protein as possible, including a high proportion of that situated in the outer layers of the grain. This protein is known to possess a higher nutritive value than that contained in white flour.

As little bran as possible so that there should be no risk of loss of nutritive value because of the presence of much indigestible material. War-time diets already contain much vegetable food with relatively large amounts of roughage; it is undesirable to increase this further.

THE TWO SELECTED FLOURS

Flour of 85% extraction can in practice be obtained by two general methods: (I) by rearrangement of the milling machinery to produce a flour containing 85% of the wheat, or (II) by addition to the white flour (73% extraction), obtained in the ordinary milling processes, of combinations of the other fractions of the wheat. The consideration which has influenced the final selection of the flour to be adopted has been the need to obtain the best nutritive value from a loaf as little removed as possible in colour, texture and flavour from that of ordinary white bread. Two flours, prepared by the methods I and II, were found to possess equal nutritive value. Flour I was selected as the best for the following reasons. Of all flours obtained at the same level of extraction by different methods from the same grist it had the highest vitamin B_1 content and in this respect closely approached that usually accepted for wholemeal bread. It had the lowest fibre content compared with other flours extracted at this level from the same grist. Of all the breads tested, baked from 85% flour, it yielded the one which resembled white bread most closely in flavour and texture. The colour of the bread was pale brown and was not unattractive. On technical and æsthetic grounds the loaf baked from it was considered excellent.

Flour I.—This straight-run flour may be defined as a flour containing 85% by weight of the clean wheat, in which is included (a) the maximum amount of the germ and of the aleurone layer, and (b) the minimum of the pericarp, as shown by its low fibre content.

Flour II may be defined as (a) containing 85% of the weight of the clean wheat grain, in which is included all the white flour, all the reduction roll tails, mill finish and purifier tails, and sufficient fine bran to bring the amount of the mixture up to 85% of the clean wheat; (b) containing 85% of the clean wheat and excluding 15% consisting of the bran and pollards.

Analyses of samples of flours I and II are set out in the table, with those of white flour of 73% extraction and of wholemeal flour, all four materials being derived from the same grist (water content being 15%).

1. See *Lancet*, 1940, **2**, 143.

Samples of flours I and II, obtained from the same grist, were found to be similar in content of protein, ash and vitamin B_1, which in both cases was over 1 I.U. per g. (thiochrome method). The fibre content of both flours was less than 0·9%, that of flour I being only about three-quarters of that of flour II. The lower the fibre content the better is the flour and the more efficient is the milling.

No exact evidence is as yet available regarding the keeping properties of the particular types of flour selected, but from the experience gained of other brown and wholemeal flours there is little doubt that this flour of 85% extraction could be kept in good state under reasonable conditions of storage for 4–6 weeks or longer.

Flour	Fibre (%)	Ash (%)	(Protein %)	Vitamin B_1 (I.U. per g.) (thiochrome method)	Calcium (mg. per 100 g.)	Phosphorus (mg. per 100 g.)	
						Total	As phytic acid
I (85%) ..	0·6	0·9	11·4	1·2	27	203	123
II (85%) ..	0·85	0·94	11·5	1·15	27	211	128
White (73%)	0–0·2	0·46	10·6	0·35	15	101	35
Wholemeal (100%)..	1·8	1·51	11·9	1·4	36	343	246

Recommendation 1.—The accessory food factors committee, at its meeting on Jan. 23, 1941, recommended that a flour of 85% extraction (similar to flour I) should be adopted. Since modification of ordinary milling machinery would be required for production of flour I and this would take time, it was further recommended that a flour of 85% extraction (similar to flour II) should be adopted in the meantime, because this could be produced without delay. The flour should not contain less than 1 I.U. vitamin B_1 per g. and the fibre should be less than 0·9% (assuming a water content of 15%).

CALCIUM AND IRON

It is known that the intake of calcium salts in the diets of this country, especially among the poorer classes, is often below the minimum accepted by nutrition experts as necessary for satisfactory growth of bones and teeth in growing children and for maintenance of the bones in adults. The addition of calcium salts to bread was recommended in the previous memo issued by the M.R.C. It is now possible to add details concerning the amounts required.

Wholemeal bread and bread made from flour of 85% extraction contain more calcium than white bread and also more phosphorus. A large proportion of the phosphorus, however, is present in a combination (phytic acid) in which it is not directly available to the organism and at the same time diminishes the availability of the calcium present in the bread and in the rest of the diet. Recent tests made on human subjects for the M.R.C. have shown that to maintain a sufficient supply of calcium salts for health more calcium salts must be added to the diet. The most convenient way to do this is to add calcium carbonate to the wheat flour used for bread. As a result of the test on human subjects who consumed about half of their total calorie intake as bread, with only small amounts of milk and very little cheese, it has been calculated that additions are needed of 0·5 mg. calcium per 100 g. white flour (7 oz. of $CaCO_3$ as creta præparata B.P. per 280 lb. sack) and of 130 mg. calcium per 100 g. flour of 85% extraction (14 oz. $CaCO_3$ per sack). In the case of the 85% extraction flour the extra 7 oz. per sack is required to neutralise the effect of the extra phytic acid contained in flour of this degree of extraction. The addition of the recommended amounts of calcium carbonate to flour has no effect on the vitamin-B_1 content of the flour or on its baking properties.

It has long been a practice in baking to add similar amounts of substances known as "improvers" (e.g., acid calcium phosphate 12 oz. per sack, or up to 4½ lb. per sack in certain self-raising flours). The addition of improvers to bread baked from flour of high extraction facilitates the work of the baker and results in a more attractive loaf. Such evidence as is available does not

justify at this stage the prohibition of their use in the baking industry, and the question has, therefore, been left open.

The desirability of adding iron in some form to flour has been considered, the reason being that anæmia due to insufficient iron in the diet is common in this country and could easily and cheaply be prevented by the administration of simple ferrous salts. A study of the available data on this subject has, however, led to the conclusion that the presence of added iron salts in flour might cause destruction of some of the other nutrients present. It is, therefore, not recommended that any such additions be made until further knowledge is available.

Recommendation 2.—It is recommended that calcium carbonate (as creta præparata B.P.) should be added to the wheat flour from which white bread is made in the proportions of 7 oz. per sack (280 lb.) of white flour and 14 oz. per sack of 85% extraction flour.

SCOTLAND

THORACIC SURGERY

Mr. Bruce Dick, F.R.C.S., in his Honyman Gillespie lecture on the surgical aspects of diseases of the chest, said that, apart from the surgical treatment of acute empyema, surgery could be employed in four types of diseases of the chest: chronic empyema, neoplasm, pulmonary tuberculosis and chronic bronchiectasis. Exact topographical diagnosis was always essential and this called for expert radiology. Anteroposterior and profile films might sometimes be sufficient but lipiodol was often needed to define the extent of bronchiectatic cavities. Tomographic films were now being used to outline the position and size of cavities, especially in pulmonary tuberculosis. The bronchoscope was particularly valuable in the diagnosis of malignant disease; indeed it was the only method allowing accurate diagnosis in the early stage when surgery could be expected to be successful. He pointed out that chronic empyema might result either from untreated acute empyema or from an acute empyema which had been inadequately drained; the commonest cause was withdrawal of the drainage-tube before the pleura had been completely cleansed and the infection eradicated. He was finding insufflation of sulphonamide powder valuable in clearing up such infection. Chronic empyemas must be thoroughly drained by rib resection at the lower fornix of the cavity, and subsequently treated by breathing exercises. Plastic operations might be required when a stiff-walled cavity would not collapse, but such operations must not be carried out when infection persisted because of the danger of cellulitis. For bronchiectasis, postural drainage and if necessary drainage through a bronchoscope must always be given a long preliminary trial in order to reduce the amount of sputum and improve the general state; but radical excision was the only means of obtaining cure. The operative mortality had shown recently a great fall especially in children. Preliminary lipiodol examination of both sides was needed before lobectomy was carried out; at operation adhesions were troublesome and the chief complication was empyema. Simple intrathoracic tumours, dermoids and teratomata, were as a rule readily removed; they had to be distinguished from aneurysms and from malignant tumours which showed smooth outline in the radiogram. Pneumothorax and thoracoscopy might be useful in diagnosis. Early diagnosis of carcinoma of the lung was all-important; all cases of hæmoptysis in adults should be investigated with as much care as cases of hæmaturia; the bronchoscope was especially useful here. So far the number of cures was not high, largely on account of late diagnosis.

The efficacy of collapse therapy in pulmonary tuberculosis was generally admitted, he said. He described extrapleural pneumothorax which collapses the lung even when the pleural cavity is obliterated by adhesions; intrapleural division of adhesions which may turn an incomplete artificial pneumothorax into a satisfactory one, and which can be done with very little risk; phrenicectomy which is often used when a cavernous lesion is situated in the central and lower parts of the lungs; direct cavity drainage, a new method giving promising results in which cavities are drained and collapsed by direct suction through the chest wall; and thoracoplasty, used for chronic types of disease in which the simpler procedures had failed, the operation being usually carried out in stages, with the removal of anything from four to ten ribs.

ADULT CRIPPLES

Prof. L. S. P. Davidson addressing the annual meeting of the Edinburgh Cripple and Invalid Children's Aid Society reminded his hearers that there were more adults crippled than children. Four years ago, he said, an investigation had been carried out in the north-east of Scotland to compute the number of people suffering from rheumatic diseases. Assuming that the incidence of rheumatism in the rest of Scotland was equivalent to that in the region studied then 300,000 people went to their doctors every year for treatment of rheumatism of one kind or another, and 50,000–60,000 people in Scotland were so completely crippled that they were unable to work for 60 days in every year. The loss of efficiency, the loss of wages, the misery and pain suffered were so great that it was time that the nation took cognisance of the facts and provided efficient treatment for them. We knew a good deal about the causes of rheumatism and we knew that the treatment of chronic rheumatic diseases was not to be found in a bottle of medicine but depended on skilled medical personnel who had been specially trained for this job. The Empire Rheumatism Council had accepted his finding that there were not available in this country the means for treatment of more than 10% of the persons suffering from these diseases.

In England Now

A Running Commentary by Peripatetic Correspondents

I HAD just emerged from a farmhouse in the country south of the city, and was thrusting my obstetric forceps into my hip pocket, when I was startled by loud backfiring from an engine. Looking up I saw an aeroplane flying low and circling around as though the pilot intended to make a landing. "By the holy smoke!" I exclaimed, "It's a Nazi!" While trying to make up my mind which way to run, I saw a splash of white appear in the sky, and thereafter my attention was about equally divided between the plane, now obviously out of control and crashing to earth, and the figure of the pilot, suspended by his parachute, floating gracefully from the sky. The breeze was carrying him towards me, and in a flash I realised my awful predicament. Here was I about to face the Nazi hordes—or one of them, at any rate—in a state of physical exhaustion after delivering the farmer's wife. I remember thinking: How like the Nazis, always catching their opponents off their guard and at a serious disadvantage! Clearly something had to be done. I ran back into the house, changed into the boots which I had just taken off (I always keep in my obstetric bag a pair of mountaineering boots with spikes in the soles), and snatching a pitchfork from a corner of the kitchen rushed out to do battle with the enemy. Not much of a weapon, I thought, but I'll try to pierce both pleural sacs at once. . . . The parachute was just disappearing behind the house, so I raced down the garden path, scrambled through a privet hedge, and there I saw the scoundrel thirty yards away rolling over on the ground. I ran up to him, panting for breath, but managed to splutter, "Who are you?" I don't know what I expected him to say, but his reply took my breath away—or what was left of it. "I'm a German airman and a gentleman," he said haughtily. By this time he had managed to assume a sitting posture, thus achieving some semblance of dignity. I was much impressed by his fine physique, and from the ugly scar on his forehead I knew at once that he must be a bonny fighter. I was relieved to observe that he showed no inclination to be truculent, and I felt increasingly embarrassed by my pitchfork. However, this problem solved itself a moment later, for the wind blew the parachute cords around my legs, and hopelessly entangled I fell in a heap in the grass. Mercifully the pitchfork dropped well out of the reach of either of us. But as I landed squarely on my tuber ischii I let out a yell of pain. "It's those——

forceps," I howled, withdrawing the battered instruments from my hip pocket, while the German looked at me in consternation. "I see no blood," he remarked, leaning over to examine the forceps. "I was speaking idiomatically," I explained loftily, "you would not understand." "I know," he suddenly exclaimed, beaming, "you are a doctor!" I nodded assent, ruefully massaging my right buttock. "That is good," he said, "can you tell me how far I am from the Royal Faculty of Physicians and Surgeons of Glasgow?" "What on earth do you want with the Faculty?" I asked in astonishment. "Listen," he said abruptly, "I explain. I am tired of the Nazis. I am a refugee. Soon after the war started I decided to be a doctor. Therefore I come to Glasgow to take the Triple Qualification. That is the best medical qualification in the world, is it not so? In Germany it is simply called the T.Q. Already I have my first examination passed, including the materia medica, and I know the Pharmacopœia Britannica." For a while I was speechless. Then I decided to test the truth of what he said by quizzing him. "What is the dose of hydrarg. cum cret.?" I asked. "Grains 1 to 5," came the prompt reply. "Well," I said half apologetically, "it's not a long step from hydrarg. cum cret. to Hitler cum Crete; tell me, what is going to be the next move in the eastern Mediterranean?" "The next German offensive will begin on . . ." Here our conversation was rudely interrupted by members of the Home Guard who seemed to have popped up out of the soil. The airman shook his head to indicate that our conversation was at an end. He had injured his ankle and we helped him to walk to the farmhouse.

I was looking forward to the broadcast that followed a few days later, but in the middle of the news bulletin I was called to the surgery to deal with a fool of a boy who had inhaled a marble. When I returned to the drawing-room I found my wife almost helpless with laughter. "Was it as funny as all that?" I inquired, rather nettled by this reaction to what must surely have been one of the most remarkable incidents of the war. "Darling," she replied, "I've told you scores of times that you really must get a new suit and a new hat. . . . Of course, I should have recognised your voice *anywhere*, but the B.B.C. actually described you as a ploughman!"

* * *

Examining in war-time, if an agreeable interlude, is not without its anxieties. What is to happen in the event—never to be disregarded in these days—of a package of answer-books being bombed beyond recognition? Replacement would be impossible and no records would be available. Presumably we should shrug our shoulders and credit the candidates with an all-round capability based on such impressions as the unwritten parts of the examination provided, which, judging by the average performance on paper, would operate in favour of most examinees. Then, the decentralisation of patients means the conduct of clinical examinations at varying distances into the country; and the uncertainty of travelling encourages a nightmare of apprehension, the possibility of agitated, hungry, and anxious candidates awaiting the arrival of their arch-tormentor immobilised many miles away. But after some gratuitous worry over things which never happen, it all comes right in the end, and one has a peculiar satisfaction at having carried on, at having refused to allow cataclysmal disturbances to interfere with routine procedures. We expect to be asked: "Has the standard deteriorated?" This would be natural from the restriction of clinical material and of teaching opportunities, not to mention the handicap of working in the midst of distractions and difficulties. It is not easy to answer, since the examiners' standard of expectation is probably lowered through an impulse to compassionate—even benevolent—consideration. I think we may find long pass-lists throughout the war.

In moments of self-congratulation or self-commiseration, the medical practitioner will sometimes feel overawed in reflecting on his privileges and responsibilities. He may not bear the shears of destiny nor hold commandment o'er the pulse of life, but there are occasions when his knowledge and skill just make the difference in these important activities. So, too, must the examiner in final subjects feel when taking stock of his privilege and responsibility in launching young mariners. How to be just, yet not too exacting? How to conduct a procedure which shall safeguard the public and at the same time oppose no unreasonable obstacle to prospective guardians of their safety? Knowledge we can assess—or at least the candidate's demonstration of his knowledge. Capacity we can only deduce—or guess. Admittedly there is no method which is an absolute criterion. Everybody knows examples of the brilliant examinee who proves eventually to be useless and unpractical; and of the chronic failure whose subsequent success is a certificate of his possession of qualities which make him a good doctor. No doubt some method could be devised to test such qualities in embryo, but so far none has; and although it is easy to tilt at the examination system and to suggest plausible alternatives, we all arrive eventually at the conclusion that notwithstanding its faults there is nothing better.

I suppose the viva-voce is the portion of the examination which is anticipated with the greatest apprehension, yet it operates far more in the candidate's favour than he generally supposes. If he is a border-line case he will be afforded the maximum opportunity to show his acquaintance with fundamentals, unless he is smitten with a sort of mental paralysis with which it is impossible for the most indulgent examiner, with all the will in the world, to contend. Such a candidate must occasionally be astonished at the type of question fired at him with the intention of estimating his character and general suitability when there has been some dubiety as to the soundness of his academic lore. Hitherto it had not perhaps struck him that a great deal can be ascertained from an inspection of the nails or that there were so many extra-abdominal causes for belly-ache. The candidate who will pass even if he failed to score a single mark in his viva is complimented by questions which give him the opportunity to qualify for honours—on such topics as the genesis of gallop rhythm or the occurrence of an Argyll Robertson pupil in conditions other than tabes.

I think that with most examiners at the present day the quality of mercy is not strained. It is sometimes maintained that a demonstration of ineptitude under ordeal should justify prejudice in disfavour: for if a man cannot rise to the occasion in his own interests, is he not likely to be found wanting when the interests of others are concerned? A specious argument, but the contrary might quite well be advanced by a skilled advocate, and anyhow I have never seen an examiner who supported the former view carrying his principle into practice.

The male we accept as the progressive sex in evolution, woman as more conservative with less likelihood to exhibit extremes; and it is not surprising that although most women do better in examinations, rarely if ever do we encounter a woman better than the best man nor one who is worse than the worst. And although all my colleagues are not in agreement, it is my firm conviction that the girls are far less nervous than their male contemporaries under interrogation. An obvious explanation is that their confidence and assurance is founded on the ability to exploit their sex. Save on those rare occasions of encountering misogynists or cranks opposed on principle to women in medicine, they can rely on the chivalry traditionally accorded to "the weaker sex," and more than chivalry when their charms so demand. Or is there after all some secondary sex advantage, so to speak, or special form of courage? Whatever the explanation, I have been repeatedly struck by the almost preposterous dithering of some stalwart young man contrasted with the coolness and self-possession of the maiden.

* * *

I was attending a middle-aged charlady—one of George Belcher's thin type with a pinched face, a red nose and a permanent dew-drop and sniffle. She was in bed and had some tummy pains. She improved but refused to admit it. One day I said to her "For goodness' sake, Mrs. Pank, pull yourself together; you know you are not nearly as ill as you think you are." She looked up at me mournfully and said, "Everything I eats, doctor, turns to gas, and oh Lor' it do frighten me so. My pore mother *died* of gastritis."

Letters to the Editor

THE STRANGERS WITHIN OUR GATES

SIR,—As an original member of the Academic Assistance Council (now Society for the Protection of Science and Learning), I have had continuous experience of medical refugees and wish to give as objective an account of the history and present state of the problem as I can.

In the prewar period of persecution the handling of academic refugees—persons driven from posts in universities or research institutes—became more and more difficult as tyranny invaded new regions; in the early days a great majority of them were "non-Aryan" Germans, but before the end of the peace others had increased in number so that the majority of non-Aryans was reduced. Pari passu the demands made on organisations dealing with non-academic medical persons increased. Some of the academics and almost all the non-academics could not be absorbed by research or teaching institutions. Opposition to permitting them to practise was great; so great that the statistically modest plan accepted by the B.M.A. of permitting 50 aliens selected by an imposing committee to qualify for practice after two years' study was violently attacked by another medical organisation. Those whose means of living did not depend on general practice in industrial cities were hardly in a position to condemn this attitude; it is easy to be generous at others' expense. The result was that when war came there were already many unemployed foreign medical men in this country supported by charitable contributions. The military disasters between September, 1939, and May, 1940, increased the number of refugees while nothing happened in this country greatly to increase the demand for medical personnel in civil life. The disasters of the summer created a general demand for the internment of aliens and a large number were interned. That cruel individual hardships were inflicted and many blunders made is probable. Those not charged with executive responsibility in a nightmare scene may well criticise these errors with moderation. Then the air attacks began in earnest. By the end of February, 1941, 58,576 civilians had been killed or wounded while synchronously increasing numbers of civilian practitioners had been drafted into the fighting services. At or about this time the Ministry of Health decided that use might be made of aliens, the Medical Register (Temporary Registration) Order in Council was made, and local authorities were notified that they *might* employ approved aliens. I am informed that, when the order came into force, the approximate number of unemployed and potentially employable aliens was between 1300 and 1400; about 750 were Austrians, Germans and Italians, 350 Poles, 250 Czechs and there were a few French and Norwegians. Of this number 61 were actually employed at the end of last month.

The process of selection is elaborate. In the first place, applicants must be approved as prima facie eligible for professional employment by the B.M.A. Next, those so approved must be approved by the public-security departments of the Government. Then some or all of those who have surmounted the first two hedges must be selected for work by an authority, local or central. Lastly the persons so selected must be registered in the special list by the G.M.C. At the end of April, 251 had passed stage 1, 170 stage 2, 100 stage 3 and 61 stage 4. So 4·4% of the potentially available were actually in use and 17·9% had been passed as fit by a professional tribunal.

That more than a thousand professionally competent persons have been unemployed for many months, and, at the April rate of progress, are likely to be unemployed for many more months is an arithmetical statement which prima facie speaks ill for our humanity and administrative efficiency. But, as a veteran statistician, I distrust prima facie inferences. Quite apart from existing rules and regulations, there is much medical work for which, in my opinion, European aliens are unsuited. It may perhaps be mere arrogance, but I honestly think that I am a better "doctor" for a "sick bay" admitting bombed-out East-enders too ill to be billeted than an alien of half my age and ten times my professional competence. I still remember enough of what I learned as assistant to my father in the East End early in the century to know when a patient is so sick as to need more professional skill than I have, and I can help to cheer up men and women of my own flesh and blood and my own age, better than a young foreigner. These spiritual duties of our profession cannot, I think, generally be performed by aliens. But in public institutions, in pukka hospitals even in the fighting services, where those in control must always be British, the technical knowledge and skill of young aliens can surely be used. I do not know what proportion of the unused 1200 have this technical skill nor even what proportion of the whole have made application to the B.M.A. I do not even know what data were supplied to the person or persons appointed by the B.M.A. to test applicants. The practice of the Society for the Protection of Science and Learning was to submit applications received to an expert committee, at least three members of which were clinicians, and in these cases full dossiers would be available. But our cases would be a minority. I think other organisations helping aliens followed the same practice. I therefore do not know whether the delay at the first fence is reasonable or not, but it is a matter for discussion in a professional journal. Whether the delay at fence no. 2 is reasonable is not a professional question at all. Finally there is the question whether those in control of institutions where professional services might be rendered do in fact seek to employ competent aliens. Because we keep silence over difficulties, it does not follow there are none. We are fighting against racial tyranny, but we are human beings and have racial prejudices of our own. Do these hinder efficiency?

Perhaps to many of your readers I shall seem to have occupied much space discussing a minor matter. The intellectual sterilisation of even 1200 refugees is not a large item in the sum total of war-time misery. But part of a duty which would seem to rest on the National Government has, as it appears, been delegated to a voluntary professional organisation. Is this improvisation working well or ill? That is, I think, an important question because in the grim years before us other medical problems not less difficult to solve will emerge.

Loughton. MAJOR GREENWOOD.

POSTWAR HOSPITAL SERVICES

SIR,—The timely article by Drs. Hunter, Perry and Vaizey in your issue of May 17 deserves the widest support. When the signatories of this letter were residents together at a London voluntary hospital we spent much time in discussing these problems because we felt that if the medical profession as a whole did not take an active interest in its own future, there was a grave danger that the recommendations of some unrepresentative body, such as the B.M.A., might be adopted by the Government. Our discussions culminated in the production of a written plan which closely resembled that of Hunter, Perry and Vaizey. We differed from them, however, in recommending a whole-time national medical service as opposed to a system of part-time contracts.

Since the time of Hippocrates, the avowed aim of the medical profession has been to make the benefits of medicine equally available to all. When private practice is examined in the light of this aim the question arises: what does the paying patient obtain for his money? Does he procure essential benefits which are denied to the non-paying patient? If so, we are falling far short of our aim. If he does not obtain any additional benefits it is unfair that he should be made to pay for that which another can obtain free. It may be argued that the patient pays for the privilege of a private consultation, but if such consultations are necessary or beneficial they should be available to everyone. This has been recognised at some hospitals where the patients are seen by appointment. Again, it may be said that private practice allows the patient a free choice of doctor, but provision for such choice would form a part of any national medical service. It is also argued that the organisers of such a service would be bureaucrats, and that the medical profession would become a branch of the Civil Service. But this is a matter of organisation, and with the disadvantages of Civil Service medicine always before us, it should be possible to evolve a system free from the worst defects of bureaucracy. Under present conditions, the balance between private practice

and hospital practice is bound to be uncontrollable and weighted in favour of the paying patient, whatever form of contract may have been signed.

J. B. ATKINS — A. F. FOSTER-CARTER
W. G. BIRKS — G. C. MACKAY
W. P. CLELAND — C. D. NEEDHAM
M. R. POLLOCK
London. J. V. DAVIES — HELEN TAYLOR.

SIR,—Few will disagree with the preliminary generalisations of Drs. Hunter, Perry and Vaizey, but let us consider their later proposals in more detail. First, they advocate the formation of a new and rather nebulous body "on the lines of the B.B.C." to coördinate the various activities of medicine. They do not mention the Ministry of Health, but surely this is the body whose function it is, or should be, to carry out this coördination. Why complicate matters by forming another and redundant executive body? The authors advocate regionalisation of hospital services, within each region "a key hospital usually a recognised teaching hospital"; but in large areas of this country no teaching hospitals exist. We see here a desire to install the teaching, or voluntary, hospital as the key hospital in every area, but many would now agree that the services to the community of the properly equipped and staffed municipal hospitals are greater than those of the voluntary hospitals in many areas. True the authors do not mention the voluntary hospital by name—possibly a tacit admission of the inevitable senescence of the voluntary-hospital system due chiefly to the failure of voluntary subscriptions to support them.

The subject of the chronic sick is touched on, and it is suggested that "clinics on the lines of Papworth" will rehabilitate these patients. Are the authors aware that Papworth is now a great manufacturing concern and can find little or no place for the chronic sick, many of whom are bedridden? Bedside handicrafts will ameliorate the lot of these patients, but the majority cannot be made into economic members of society.

The authors next consider the terms of appointment of medical staffs to the hospitals and conclude that they should be paid, but no scale of remuneration is suggested; at the same time they state that full-time contracts produce a service which would encourage "mental staleness and inertia instead of the wider and more independent outlook." This is a matter of opinion, but all the fighting services evidently consider that whole-time employment is more effective both for its medical and combatant officers, and the same applies to an increasing extent in the public-health services. It is further stated that part-time contracts would benefit the cultural status of the profession. Why? Surely a doctor who drives a renovated Rolls-Royce is not therefore more cultured than one who has no need to spend money in this way.

Coming to hospital administration, the authors state that this should be in the hands of trained laymen, though no real reason for this statement is given. An attack on the whole race of medical superintendents now follows—they should be abolished because among other things "the establishment of such a senior resident post often tends to a cramped outlook which reacts badly on its occupant." As a medical superintendent I am admittedly biased, but I cannot see that this statement has any real meaning. Surely the wide problems—clinical, administrative and human—with which a medical superintendent has to deal will, if anything, widen his outlook. Nor need a medical superintendent be "harassed" or "ill equipped with knowledge." He is chosen for his post, for which competition is extremely keen, and the qualifications of most medical superintendents will bear comparison with the honorary staffs of voluntary hospitals and will often include the D.P.H. which gives them a wider outlook on medicine as a whole. More incorrect still is the remark that the medical superintendent tends "to become a wary political fencer who views each new advance as a potential source of complaints which must be stifled if he has to retain his job." Medical superintendents do not in fact lose their jobs for encouraging new advances, and this statement can be baldly dismissed as absurd. If these remarks are the best evidence that can be adduced against medical superintendents there is no case for their abolition, and I would go farther and say that increased lay control of our hospital services is one against which we should be more than ever on our guard. No layman can have the same grasp of the problems of the treatment of the sick as a well-qualified and experienced doctor.

There is in other respects much truth in what the authors say, but the article gives a one-sided view of the future hospital service. It seeks to bolster up the voluntary hospital and the financial (and cultural!) status of its staff without taking any cognisance of the great and increasing work of the municipal hospitals.

These views are my own and do not necessarily represent those of the authority I serve.

Godalming. W. SNELL.

LOCAL APPLICATION OF SULPHATHIAZOLE

SIR,—In their very interesting communication in THE LANCET of March 1, Colonel Colebrook and Major Francis described the disappearance of hæmolytic streptococci in superficial wounds after the local application of sulphanilamide. They also pointed out that group D hæmolytic streptococci were found to be resistant to this drug. In view of the observations of Helmholz and Neter, indicating greater activity of sulphathiazole than of sulphanilamide on group D hæmolytic streptococci, a patient with a severe wound infection due to this organism following an exploratory laparotomy was treated with sulphathiazole. The preparation used was that of Dr. F. Meyer (sulphathiazole-xylose), 4 grammes being applied locally every day. During this treatment the wound healed and hæmolytic streptococci finally disappeared. Although no conclusions can be drawn from a single case the observation suggests that sulphathiazole may be of value in the local treatment of group D hæmolytic streptococcal infections.

Buffalo, New York. ERWIN NETER.

ENDOCARDITIS LENTA

SIR,—In reply to Dr. Magnus Haines's question (May 24, p. 681), I quoted Dr. J. A. Capps's paper as a recent review of the subject, but would certainly not wish to depreciate the work of my friend, Dr. E. Libman, in 1913, though possibly blood-cultures were less to be relied on at that date. By the way, my case illustrates the point that improvement in symptoms, almost amounting to temporary clinical recovery, may occur before the blood becomes sterile, whereas when the blood remains sterile and the *infection* seems to be recovered from, the damage already done is likely to be so great that real recovery from the *disease* is out of the question. Dr. Haines's observations in his own cases by modern methods help to confirm those of Libman by the technique of 1913.

London, W.1. F. PARKES WEBER.

CONGENITAL PYLORIC STENOSIS

SIR,—I have read with considerable interest Dr. Dobbs's article on congenital pyloric stenosis. It appears to me that there is still lack of appreciation of the distinction between simple pylorospasm and congenital hypertrophic stenosis of the pylorus. The former is amenable to medical treatment, the latter demands early surgical interference. Atropine may diminish the spasm, but it cannot cure the hypertrophic condition of the muscle which may extend to the stomach and even to the œsophagus. My contention has always been that if a tumour can be felt the diagnosis of stenosis must be made; but if no tumour is made out the case is one of simple pylorospasm. My experience, of course, may be exceptional, but I have yet to come across a case of stenosis in which there is no tumour. This, I think, explains the success of atropine in some cases and not in others. After the surgeon has performed the operation the patient should be handed over to a physician fully experienced in infant feeding, a subject with which the surgeon cannot be expected to be conversant. All this has been my teaching for years and I see no reason for departing from it.

Edinburgh. JAMES BURNET.

CASUALTY ORGANISATION BY THE HOME GUARD

SIR,—The problem of dealing with casualties in case of invasion cannot be met by the arrangements which have hitherto proved adequate for air-raids. Any steps now taken must depend on coöperation between three services—the Army, the Home Guard and the local authorities. I do not include the Emergency Medical Service because this is a hospital service and I am considering only the primary treatment of casualties until they can be removed by ambulance. Coöperation depends on each party knowing what the other is able to do. It may be useful to set out what is being done by the Home Guard in one zone, since our service has developed on the only lines which circumstances allowed, and other areas may need to adopt similar plans.

We may have to face complete severance of normal communications by road and telephone, for a period varying with the persistence of enemy attack. This is a possibility which the lay mind does not easily grasp—thus, the A.R.P. services are still content to rely on the collection and removal of casualties by motor ambulance. Severance of communications will not affect all areas at the same time, but we must make our preparations in all alike. We must be prepared to collect our own casualties on stretchers, improvised or otherwise, and carry them by hand to places at which they can be looked after for three or four days, perhaps more. Since our stretcher-bearers are fighting men first and stretcher-bearers only when circumstances permit, these places have to be close to every point at which casualties might occur. We have aimed at setting up at least one casualty collecting post (C.C.P.) in every square mile of the county. It would be a waste of energy to set up these posts where similar posts under the control of some other authority already exist. We have therefore plotted all such posts on a map and then tried to fill up the unoccupied miles. Such posts fall into three main groups:

1. Regular military posts. Some of these are fixed posts, some are theoretically mobile but are so likely to remain fixed during invasion that it has not seemed worth while to duplicate them. Others are frankly mobile and we cannot be sure that they would be there when needed; these we have had to disregard. The military authorities will certainly give every help in their power.

2. A.R.P. posts and points. Most first-aid posts could retain casualties for two or three days if necessary, but the "points" are different; most of them consist of a box of dressings costing 15*s.* and of nothing else. A few have been built up by local endeavour to the status of small hospitals. The exact facts must be ascertained in each case before they are put on the map.

3. Public assistance institutions, isolation and smallpox hospitals, children's homes, sick-bays and so forth have both dressings and accommodation which could be used in emergency. These go on the map.

The problem of filling up the vacant miles resolves itself into visiting suitable private houses, inns, works, and so on, and persuading those in charge to be ready to take casualties if called upon. They are usually very willing to do so. The C.C.P.s must be provided with dressings and medical attendance. Local general practitioners, retired practitioners, married women practitioners and dental surgeons with medical degrees can often accept responsibility for a small number of posts in their vicinity. If this is not possible, the village nurse may be able to help, or any other nurse likely to be available in emergency. V.A.D. and St. John helpers are usually already attached to some A.R.P. post or point. The use that can be made of them depends on the local A.R.P. controller, who is often, alas, rather difficult to convince of the need for real coöperation. Dressings are at present unobtainable except by voluntary endeavour. Some units have collected funds for the purpose and have quite a good supply, others must depend on the official supply, which was apparently intended for some other need than that which we have actually to face. It consists of first-aid gauze dressings and a few rather unsatisfactory wooden splints. It is to be hoped that it will presently be augmented.

Staffing is by one senior medical officer, some group M.O.s, where circumstances make this convenient, one M.O. per battalion, and as many company M.O.s as we can enrol. They have all been promised that they will in no case be required to undertake either whole-time service or any other service which would conflict with civilian obligations. Their help is given subject to the approval of the local medical war committee which has to be satisfied that their employment by the Home Guard will not unduly interfere with civilian services. Some committees tend to dictate the exact terms of employment and even the rank which such officers should have, but it does not appear that they are entitled to do so.

The duties of the Home Guard medical officer have thus proved, rather surprisingly, to be purely administrative and to include no medical treatment whatever. It is true that many of them will attend at C.C.P.s in their civilian capacities, and will there treat as many civilians as Home Guards. But the Home Guard medical service, as such, does not guarantee to do more than arrange to the best of its ability that no Home Guard shall go without the best care possible in case of emergency. The essence of the C.C.P. system is a network of one-mile mesh all over the country and its efficiency will depend on making sure that everyone in the neighbourhood knows where help can be found in emergency.

A leaflet has been prepared for distribution to those who agree to organise Home Guard C.C.P.s. This, after setting out the problem, asks them to be ready, when the church bells ring, to set up a sort of temporary rest hospital for six or eight wounded. Nothing very complicated can be aimed at, but it ought to be possible to provide for the wounded: (*a*) protection from the weather; (*b*) warmth; (*c*) rest, if possible, on beds, palliasses or cushions; (*d*) simple cooking, such as the provision of soups, bread and butter, &c.; and (*e*) such skilled care as may be possible—in some cases a doctor will be available, in others a trained nurse of V.A.D., in others simple home nursing.

GORDON WARD.

EPILEPSY AND AIR-RAIDS

SIR,—In view of the articles by Drs. Tylor Fox and Shafar in your issue of May 17, the following patient, whom I saw on May 21, seems of interest.

A woman of 43 gave a history of major and minor epilepsy starting at the age of 7. This had been treated with bromide and Luminal until 5 years ago when the fits ceased and she stopped treatment. In October, 1940, she was outside the house when her husband was killed at her side by a bomb and she herself was wounded in the legs. She was not concussed, and was still standing holding on to a railing after the explosion. She was assisted to a first-aid post and taken into a hospital; while there the minor attacks recurred and she was given luminal. After her discharge she had a major fit in January, 1941, and since then she has had 5–6 major and 2–3 minor fits. The last major fit was observed by a nurse, who described to me a typical major epileptic attack with incontinence. Hysteria may therefore be excluded. On examination she showed no abnormal neurological signs.

Of course in this case there may have been some slight mechanical damage to the brain from blast, but it is possible that the emotional shock may also be involved.

London. N. G. HULBERT.

PAROXYSMAL HÆMOGLOBINURIA

SIR,—May I correct an error in your leading article of May 24. In the patients with paroxysmal nocturnal hæmoglobinuria it is increased *acidity* of the blood which increases the hæmolysis, possibly through increased alkali excretion during sleep. Similar results have been reported by T. H. Ham (*Arch. intern. Med.* 1939, **64**, 1271) and by G. C. Ham and H. M. Horack (*Ibid*, 1941, **67**, 735).

Royal Infirmary, Manchester. M. C. G. ISRAËLS.

GEVIFLEX (Allen & Hanburys) is a gentian-violet jelly for application to burns, as an alternative treatment to tannic acid. It contains 2% gentian violet with phenyl mercuric nitrate 1–3000, and is packed in tubes containing 1¼ oz. and 5 oz.

Obituary

D'ARCY POWER

K.B.E., B.M. OXFD, F.R.C.S., F.S.A.

Sir D'Arcy Power, who died at Northwood on May 18 at the age of 85, spent exactly half his life at St. Bartholomew's Hospital which he entered as a student in 1878 and left in 1920 when he was elected consulting surgeon and governor; and this hospital was to him, as to his father before him, the breath of his life. But perhaps more than any other surgeon of our time his sphere of action was extra-mural and he became the accepted narrator of surgical lore and the biographer of surgeons throughout the ages. Almost his last act was to present to the Royal College of Surgeons a supplement to "Plarr's Lives" bringing the necrologies right up to the year 1940. Like John Hunter, whose human side he apostrophised in an oration in 1925, he had the magnetism which attracts kindred spirits and to a circle far beyond his own pupils, with whom he was in contact by letter or by word of mouth, he also was "the Dear Man."

Lafayette

D'Arcy Power was born in Belgravia and educated at St. Marylebone and All Souls' Grammar School and at Merchant Taylors' School. He matriculated from New College, Oxford, in 1874 and obtained a first-class in the honours school of natural science in 1878, taking his M.A. in 1881 and his M.B. the following year. His twin interests of surgery and bibliography were already getting hold of him and in 1883 he was awarded the house-surgeon prize at Bart's and obtained his F.R.C.S., while the following year he was appointed curator of the hospital museum. Even after he became assistant surgeon on Sir Thomas Smith's retirement in 1898 he continued to demonstrate surgery and surgical pathology. In 1902 he was put in charge of the throat department and two years later, when John Langton dropped out, he became full surgeon. When he retired besides his duties as governor he found time to act as honorary keeper of the muniments of the hospital. At the Royal College of Surgeons he had a similar record of achievement and service. He was in turn Hunterian professor, Bradshaw lecturer, Vicary lecturer, Hunterian orator, honorary librarian and trustee (in place of Lord Rosebery) to the Hunterian collection. He was a member of the Royal College of Physicians committee on the nomenclature of diseases, and he represented his own college at the International Historical Congress in London in 1913, on the Royal Commission on Venereal Disease in 1914, on the executive committees of the British Empire Cancer Campaign and of the Imperial Cancer Research Fund, which only this year elected him in his own right to the council in recognition of special services. He was an honorary fellow of the Royal Australasian College of Surgeons and of the Faculty of Physicians and Surgeons of Glasgow. Before the last war he was a territorial officer and in August, 1914, he was promoted lieut.-colonel and put in charge of the first London General Hospital, and his work there won for him a K.B.E. in 1919.

Hardly anyone on the Medical Register had not faced him as a just but friendly examiner at some time, for besides examining for half a dozen universities he also interviewed R.A.M.C. and I.M.S. candidates. For many years he gave generously of his time as chairman of the Royal Medical Benevolent Fund and as visitor for King Edward's Hospital Fund. He belonged to innumerable societies in this country, on the Continent, and in America, where his medical and antiquarian contacts were discerning and widespread. An invitation in 1930 to give a series of six lectures at Johns Hopkins was his red-letter day. His learned writings must have numbered nearly a thousand and only Power himself could have done justice to a bibliography of them. His own choice collection of early printed books on medicine and surgery will attract book-lovers when they come up for sale shortly.

Twenty-one years ago, G. E. G. writes, D'Arcy Power retired from the post of surgeon to St. Bartholomew's Hospital. To mark the moment a group of his old friends, dressers and colleagues presented him with a replica in silver by Omar Ramsden of the Wounded Cromwellian Soldier in the Steward's office. This was symbolic of much of D'Arcy Power's life. Firstly he was a surgeon, but he was more than a surgeon, for he was trained in physiology and took a first class in the school of natural science at Oxford. Moreover he was as interested in the history of the literature of his craft as he was in the technical side, and from an early age he began to write. "I have always been able to write," he said, "and that is my greatest asset." If the pen is greater than the sword it is also greater than the scalpel, and his works will live after him and he will be remembered when many a surgeon of greater technical skill will be forgotten.

D'Arcy Power's name may be remembered as a surgeon, historian, bibliographer, mason, committee-man, councillor and vice-president of the Royal College of Surgeons, and as participator in innumerable activities connected with his profession. To his intimates he remains a dear old friend. When first appointed assistant surgeon at St. Bartholomew's Hospital so many years ago the irreverent but clear-seeing students dubbed him "Sunny Jim," an apt nickname which stuck. As nicknames often do, it tells of a man's character. D'Arcy had a happy sunny disposition, always cheery, never complaining. As years went by he took his share of blows. His only daughter died of whooping-cough at the age of two. His younger son was killed at the second battle of Ypres. His wife, Eleanor Fosbroke, died and left him to a rather lonely old age. Yet there was never the least bit of a moan about anything.

And now that he has gone to his rest, he stands out not so much as a single individual, but as one of a chain of stouthearted English doctors continuing to serve mankind. For his father, coming from an old Yorkshire family, was Henry Power, the ophthalmic surgeon, a fine figure of a man. His son, D'Arcy II, is high up in the medical service of the Royal Air Force, and his grandson, D'Arcy III, is following the same profession. Here indeed is a family that have served their country well.

JOHN WIDDICOMBE OLIVER

M.R.C.S.; SURGEON LIEUT.-COMMANDER, R.N.

Surgeon Lieut.-Commander Jack Oliver who was killed in action during March at the age of 33, was the elder son of Mr. and Mrs. W. H. Oliver of Old Bosham. Educated at Felsted, he obtained a scholarship to Guy's Hospital and qualified in 1931. After spending a few months as resident medical officer at Ashford Hospital he joined the Navy at the end of that year. He served for six months in the R.N. Hospital at Haslar before he was posted to the China Station for two and a half years on H.M.S. *Falcon*. On his return he specialised in psychiatry and after holding a post at the Royal Marine Infirmary at Chatham, he was moved to the Royal Naval Hospital at Great Yarmouth.

Weir, Greenock

Surgeon Captain C. M. R. Thatcher, who served with him there, writes: Oliver's death is a great loss to the Service where he had undoubtedly a brilliant future in front of him. Besides being extremely efficient at his work he had the most charming personality and was popular with all he met or served with. In the years Oliver served with me I never saw him ruffled or worried and any duty he might be detailed for was carried out efficiently and with no fuss. He was keen on games and altogether an ideal officer and messmate.

Oliver was promoted surgeon lieut.-commander in 1937 and joined H.M.S. *Bonaventure* as senior medical officer in 1940. He leaves a widow and two children.

ALEXANDER ARTHUR SUTTON

C.B., D.S.O., L.R.C.P.E. ; MAJOR-GENERAL R.A.M.C. RETD.

Major-General A. A. Sutton, who died at Tunbridge Wells on April 12 in his eightieth year, took the Scottish conjoint in 1884 and received his commission as surgeon the following year. He was promoted surgeon major in 1897, and the next year took part in the protectorate expedition in Sierra Leone, where he was severely wounded. He saw further service in South Africa, where he was again wounded at Paardeberg, and he was mentioned in dispatches and received the D.S.O. At the outbreak of the last war he was in command of the R.A.M.C. at Aldershot depot, and a colleague has described how he worked unceasingly for the welfare of the men of Kitchener's army many of whom had to be accommodated at short notice, and how he often stayed with them until the early hours of the morning until he saw them comfortably bedded. In 1915 he was appointed D.D.M.S. in Macedonia, and during his time there he was twice mentioned in dispatches, created C.B. and awarded the order of St. Sava. He returned home to command the R.A.M.C. depot at Blackpool, and it was from here that he retired in 1922. As a commanding officer General Sutton was able to temper discipline with friendliness, and his inner knowledge of his men made his concern for the well-being of the young soldier fruitful.

By his first wife General Sutton had two daughters and two sons who are now serving in the R.A.M.C. In 1917 he married, as his second wife, Miss Mary Wilson, R.R.C.

HERBERT ELWIN HARRIS

M.B. LOND., F.R.C.S.

Herbert Elwin Harris was born in 1860 at Binham in Norfolk, where his family had for many generations been gentlemen farmers. He was educated at a school in Truro kept by one of his uncles. He went up to Christ's College, Cambridge, taking his mathematical tripos in 1882. At the same time he took his first M.B. and continued his medical studies at St. Bartholomew's Hospital, where he qualified M.R.C.S. in 1885 and L.R.C.P. in 1886, and got his M.B. two years later. After qualifying he went to Plymouth as house-surgeon but soon returned to London, where for some years he worked in various poor-law infirmaries. In 1896 he settled in general practice in Bristol, and it was during this year he obtained his F.R.C.S. Shortly afterwards he was appointed anæsthetist at the Royal Hospital for Women and Children, and a few years later he was elected surgeon and given charge of the ear, nose, and throat department. During the last war Dr. Harris was on the staff of the Second Southern (Territorial) General Hospital with the rank of Captain R.A.M.C. and worked as a surgeon at the Beaufort War Hospital, Fishponds, Bristol.

Dr. Harris was president of the Bristol Medico-Chirurgical Society in 1933–34 and for many years he was a member of the British Medical Association. In his early years of practice he was an enthusiastic cyclist, and later he was one of the first medical men in Bristol to drive a motor-car. The hobbies of his later years were photography and gardening. His patients and his colleagues found him a friendly, courteous man, and he was a skilful surgeon of sound judgment.

Dr. Harris was twice married—first to Miss Edith Higginson, and of this marriage he had three children. A daughter and a son, who succeeded to his father's practice, survive him. His second wife, Miss Nellie Thompson, lived only a year after their marriage, and they had no children.

In 1934 he retired from practice and lived at Halse, near Taunton, where on May 20 he died suddenly, within a short time of his eighty-first birthday.

MR. J. H. PRINGLE

As one of his oldest friends may I add a few words of personal appreciation to your brief notice of J. Hogarth Pringle? We were both hospital residents in Edinburgh in 1886–87 and we worked together and lived together in London afterwards. Pringle, as you remark, had not the pen of a ready writer and public speaking was no pleasure to him, although he could on occasion express himself clearly and forcibly both in speech and writing. His manner undoubtedly had a certain aloofness, partly the result of shyness, partly the result of absorption in the work on which he happened to be engaged, but it soon became warm and cordial. In a little coterie of his own friends he was full of geniality and a somewhat sardonic humour. But he was a true kindhearted friend, and generous almost to a fault in any case of real need.—J. T.

Parliament

Care of the Merchant Seamen

IN the House of Lords on May 20 the Earl of CORK and ORRERY complained that there was an unfair differentiation under the Ministry of Health's hospital scheme between the treatment accorded to invalid merchant seamen and patients from the Royal Navy, the Army and the Air Force. Officers and men in the mercantile marine, he said, were not classed as "service sick" or "service casualties," and they did not get the service ration. In certain circumstances they were supposed to contribute to the cost of their maintenance in hospital—a charge unknown against a naval rating. This matter had been taken up by the Seamen's Hospital Society, and the official reply was that "unless injured as a result of enemy action, or unless injured by anything which happened at any point of time when the man was on duty," the seaman was to be asked to contribute towards his maintenance; how could the "point of time" be determined at which a man had contracted, say, pneumonia or rheumatism, or when heart affection or eyestrain or nervous spasm started? He urged that all these petty restrictions should be swept away and the officers and men of the Merchant Navy should be placed on the same footing as their comrades of the Royal Navy.

Lord AILWYN, as post captain, and Lord GIFFORD as lieutenant commander, supported the admiral of the fleet's appeal, and Lord Gifford pointed out that the sailor is a man who likes his moan.

In reply Lord CROFT, parliamentary secretary to the War Office, assured Lord Cork that officers and men of the Merchant Service receive the same medical treatment under the Emergency Hospital scheme as members of the fighting services. Treatment was given at the cost of the Government for injuries, including illnesses, due to enemy action or sustained in the course of their duty, even if not due to enemy action. These men would get all the advantages of the nation-wide organisation of the E.H.S. They were admitted or transferred to the hospital best suited for dealing with their case, and were sent, if necessary, to special centres, such as orthopædic hospitals, head centres or chest centres. Convalescent treatment could be given where needed at one of the Red Cross auxiliary hospitals.

If a seaman was suffering from an ordinary illness, not directly arising from his calling and was absent from his home town, he could be admitted to an E.M.S. hospital. The only difference from the services was that unless the man belonged to a contributory scheme, he would be asked to make a contribution. The Government, however, defrayed the rest of the cost. This was considered no hardship in view of the rates of pay of the Merchant Navy. In the seaman's home town the local hospital would admit him, and the usual financial arrangements of the hospital would apply. At the moment the service patient was entitled to a higher meat ration than the merchant seaman, but the Minister of War Transport has asked the Minister of Food to consider whether the Merchant Navy could not be put on the same footing as the Royal Navy.

A National Fire Service

The debate on the Fire Services (Emergency Provisions) Bill, which passed through all its stages at a single sitting of the Commons, resolved itself more or less into a discussion on how our system of local government was standing up to the strain of total war. On the whole, the House felt that it was unfair to ask local authorities to go on dealing with services—such as fire-fighting—which had become military operations rather than municipal functions, and Commander STEPHEN

KING-HALL reminded members that in the past we had found it necessary to remove the Navy from the control of the burgesses of the Cinque Ports and make it a national service.

The central proposal of the bill is the welding of the 1400 fire brigades of England and Wales into fewer than 50 large fire-fighting forces, which will be organised in regions, each with a regional commissioner and under the general direction of a chief of staff in London. In moving the bill Mr. H. MORRISON admitted the fire brigade was often held to be the brightest jewel in the municipal crown, but experience in recent air-raids had shown that the small size of the basic units of the municipal fire services was a fundamental weakness.

In a review of other civil-defence improvements Mr. Morrison said he was suggesting to local authorities who could not supply meals for A.R.P. workers that an allowance of 2*s.* should be paid to volunteers on an eight-hour spell of duty, and 3*s.* for a twelve-hour spell. Paid A.R.P. members absent through sickness up to a maximum of 13 weeks will get full pay in future, not only when the sickness is due to war service injuries but also when it arises out of other conditions of their service. He hoped to arrange for whole-time workers in heavily raided districts to receive one free return railway voucher a year for their annual holiday.

National Health Insurance

In a statement to the House after question time Mr. E. BROWN said:

The Government intend to introduce legislation shortly designed to give effect to certain changes in the health-insurance scheme to meet war-time conditions. The Government hopes to overhaul the existing schemes of social insurance, particularly health and pensions insurance and workmen's compensation. Legislation for so wide a purpose could not be introduced at an early date, but the Government are of opinion that the comprehensive survey of the existing schemes—an essential preliminary—should be set on foot at once as part of post-war planning. This survey is to be undertaken forthwith by the Minister without Portfolio in association with the other ministers concerned. The Bill which the Government intend to introduce shortly will propose, as from the commencement of the next benefit year in January next, to increase by 3*s.* the statutory rates of sickness and disablement benefits payable under the Health Insurance Acts. That is to say, the sickness benefit for a man would be raised from 15*s.* to 18*s.*, and his disablement benefit from 7*s.* 6*d.* to 10*s.* 6*d.* For single women and widows the new rates would be 15*s.* and 9*s.* respectively, and for married women 13*s.* and 8*s.* Additional benefits will, of course, continue to be payable over and above these minimum rates. These changes will be made possible by the payment of state grant on the usual basis and by increasing by 2*d.* the weekly contributions payable in respect of men and women alike—1*d.* of this increase to be borne by the employer and 1*d.* by the insured person.

The Bill will also propose to raise to £420, as from January next, the remuneration limit for the compulsory health and pensions insurance of non-manual workers. In addition to other health and pensions rights, this will give to rather less than 500,000 fresh persons a title to free medical treatment and attendance, and the new position thus created is being discussed with the medical profession.

QUESTION TIME

Diphtheria Immunisation

Sir FRANCIS FREMANTLE asked the Minister if he would take action to promote a concentrated effort to secure immunisation of all children against diphtheria, in order to save the loss of some 2500 children from death every year and to stamp out the disease as had been done in other countries.—Mr. BROWN replied: A vigorous campaign to promote the immunisation of children against diphtheria is already being pursued, in coöperation with the Central Council of Health Education, through the medium of special posters and leaflets, circulars to local authorities, broadcast talks, press publicity, films and window displays. Every possible step will continue to be taken to bring home to parents the importance of this matter.—Sir F. FREMANTLE: Is anything being done to ask members of Parliament to assist this drive to stamp out this appalling disease?—Mr. BROWN: I am sure members will take note of that.

Commander R. T. BOWER: Certain members of the medical profession are opposed to immunisation and that does not do much good to the campaign.—Sir F. FREMANTLE: There are members of the Navy who are opposed to the naval policy.

Vitamin Biscuits

Mr. G. MANDER asked the Parliamentary Secretary to the Ministry of Food whether he would now give consideration to the possibility of preventing most cases of nutritional deficiencies by providing a biscuit, for all who desired it, containing the minimum daily requirements of the most important vitamins and minerals, in view of the fact that production of such an article on a large scale would be simple and cheap.—Major G. LLOYD-GEORGE replied that this matter had been carefully considered. There was much natural vitamin available, and constant research was being carried out with regard to putting vitamins into various forms of food, but investigations had shown that biscuits were not the best form of food in which to put vitamins.

Conscription of Doctors in Northern Ireland

Mr. D. J. LITTLE asked the Prime Minister whether he had considered the resolution from the Northern Ireland branch of the British Medical Association to the effect that conscription should be applied at once to the medical profession in Northern Ireland on the same basis as in Great Britain; and whether he would accede to this request.—Mr. C. ATTLEE who replied said: The Prime Minister is unable to trace the receipt of the resolution. If he may have a copy it will be considered in connexion with the statement on the general question of applying conscription in Northern Ireland which he hopes to make very soon.

[Mr. CHURCHILL has since stated that conscription will not be applied to Northern Ireland.]

SLIDING SCALE FOR NURSES

The Royal College of Nursing has recommended the following standard scale of yearly salaries for nurses.

Staff-nurse £100–£5–£150.

Ward sister £150–£10–£250 (sister i/c of a department £20 more).

Housekeeping sister £160–£10–£220.

Night superintendent £200–£10–£250.

Night sister £150–£200.

Salaries of matron, assistant matron, and home sister depend on the number of beds within the following limits:

	Less than 100 beds	Over 500 beds
Matron ..	£250–£25–£400	£600–£50–£1000
Asst. matron	£175–£25–£250	£300–£25–£500

For home sisters the scale begins at £140 in the smaller hospitals rising to a maximum of £220 after five years' service in the larger. The college holds that a sister tutor should never alone be responsible for more than 60 students and suggests the following salaries:

Sister tutor (single-handed) £200–£15–£350.

Sister tutor (with two assistants) £300–£25–£500.

Asst. sister tutor (qualified) £200–£15–£350.

Asst. sister tutor (unqualified) £150–£10–£250.

The college discourages the tendency to increase the salaries of student nurses out of proportion to those of the qualified nurses. The Minister of Health has announced a commencing salary of £40 for nurses training under the Civil Nursing Reserve scheme. For others the college recommends a salary of £30 rising to £35, £40 and £50 in the second, third and fourth years. Non-resident allowances should be assessed as follows.

Administrative grades	£120 p.a.
Sisters	£110 „
Staff-nurses	£104 „

Manchester public-health committee has recommended the city council to authorise an annual rise of £25 on their basic wages to all trained nurses and sisters in their hospitals. This means that nurses will now start at £95 p.a. The salary of student nurses will be raised from £30 to £40 for their first year. Middlesbrough corporation is also raising the salaries of its nurses. Assistant matrons, home sisters, night sisters, ward sisters and staff-nurses will begin at their former maximum rates (£125, £120, £115, £110 and £95 respectively) but will receive no annual increments; student nurses will start at £35 and rise to £45.

Medical News

University of Oxford

A two-month course of instruction for the diploma in ophthalmology will begin at the Oxford Eye Hospital on Monday, Oct. 13. The examination for the diploma will begin on Dec. 8; names must be received at the university registry not later than Nov. 19.

National University of Ireland

The following official degrees are to be conferred :—

M.Ch.—Prof. R. D. Joyce, Dr. P. J. Keogh and Mr. P. J. Dempsey. M.D.—Dr. J. A. Geraghty. M.A.O.—Mr. R. J. White.

A meeting of the Biochemical Society will be held at the National Institute for Medical Research, Hampstead, N.W.3, on Saturday, June 7, at 2.30 P.M.

At the annual general meeting of the Royal Medical Benevolent Fund held on May 14, Sir Thomas Barlow, F.R.S., was re-elected president; Dr. Lewis Glover, hon. treasurer, and Mr. R. M. Handfield-Jones, hon. secretary.

The Ministry of Health has arranged with the British Hospitals Association that voluntary hospitals that have had to reduce the number of their civilian beds on account of bombing shall compensate the ministry according to the number of beds closed. A proportion of the hospitals' normal sick will be treated at the expense of the Emergency Hospital Scheme in the outer hospitals, and the minister feels that it is fair that the hospitals should make some contribution to the cost.

The Katherine Berkan Judd prize of a thousand dollars has been awarded to Prof. E. L. Kennaway, F.R.S., director of the Chester Beatty Research Institute at the Royal Cancer Hospital, London, and to Prof. J. W. Cook, F.R.S., regius professor of chemistry in the University of Glasgow. The prize is awarded annually by the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, for outstanding contributions to the knowledge and cure of cancer during the previous two years.

The Medical Research Council has made a grant to the London County Council of £200 a year to pay a technician at the central pathological laboratory. In 1938 the Rockefeller Foundation agreed to provide £5000 a year for five years for psychiatric research at the Maudsley Hospital. The war has limited the scope of this work, but in agreement with the foundation a programme of research on a small scale is being carried out at one of the emergency hospitals to which the foundation has made a grant of £1500. It has also given £300 to buy special apparatus for an investigation at another emergency hospital.

An award of the Dr. Jessie Macgregor prize of not less than £50 will be made in July for the best original work in the science of medicine presented by a medical woman who is a graduate of the University of Edinburgh, or who has taken the triple qualification, and who has studied medicine for at least one year in Edinburgh before qualifying. The work may be published or unpublished, but must not have been published more than three years ago. The successful applicant shall, within six months of the award, deliver a lecture on the subject of her work. Applications must reach the convener of trustees, Royal College of Physicians, Edinburgh, 2, not later than June 30.

In a recent circular (No. 2362) the Minister of Health reminds local authorities and joint tuberculosis boards that when a tuberculous person changes his residence permanently his records should be transferred to the new area. But the minister does not consider that evacuation constitutes a permanent change, and unless the transfer has already been made he would not have the records of evacuees moved. On the whole, local authorities have coöperated well to ensure continuity of treatment for the tuberculous. Some authorities give each patient a postcard addressed to the T.O. on which he is asked to send his new address if he moves. The minister thinks this practice might well be extended especially in areas liable to air attack.

THE Pharmaceutical Society has received an assurance from the Ministry of Labour that May 31—the final date fixed for application for deferment by men liable to military service—does not apply to pharmacists and dispensers. Men in these categories (see THE LANCET, May 3, p. 577) will not receive their calling-up notices until their cases have been considered by the Central Pharmaceutical War Committee, and they should do nothing until they receive a communication from the committee. A questionnaire will be sent to every pharmacist on the register whether or not of military age, for the age may be raised later and the committee wish to have details of the pharmaceutical situation in all localities. The Ministry of Labour requires to know the number of men released for service, and to have an indication in each national health insurance area of the proportion who remain. The hospital cases will be considered by a special subcommittee centrally and the shop cases will be sent to the pharmaceutical committees. The Central Pharmaceutical War Committee will require the pharmaceutical committees to classify the men as (a) those who should go and (b) those who should stay, giving their reasons where they recommend retaining a man. Retention will be recommended only where it is shown that pharmaceutical work of public importance is being done by the man and that no substitute can be found.

Infectious Disease in England and Wales

WEEK ENDED MAY 17

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1153; whooping-cough, 4086; diphtheria, 926; enteric fever, 34; measles (excluding rubella), 11,909; pneumonia (primary or influenzal), 1067; puerperal pyrexia, 126; cerebrospinal fever, 284 (Liverpool 18, Birmingham 14); poliomyelitis, 2; polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 77; ophthalmia neonatorum, 80. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns there was no death from smallpox, scarlet fever or enteric fever, 27 (2) from whooping-cough, 17 (0) from measles, 25 (3) from diphtheria, 36 (5) from diarrhœa and enteritis under 2 years, and 21 (2) from influenza. The figures in parentheses are those for London itself.

Birmingham had 3 fatal cases of measles and 3 of diphtheria. There were 5 deaths from whooping-cough at Liverpool, and in the same week Glasgow reported 10.

The number of stillbirths notified during the week was 219 (corresponding to a rate of 40 per thousand total births), including 18 in London.

Appointments

DE SWIET, JOHN, M.D. Lond., M.R.C.P.: assistant physician at Staines Hospital.

KIRKBY, W. M., M.R.C.S.: examining factory surgeon for Porthcawl, Glam.

PARRY-JONES, WILLIAM, M.R.C.S.: examining factory surgeon for Llangefni, Anglesey.

Births, Marriages and Deaths

BIRTHS

BRADSHAW.—On May 21, the wife of Dr. D. B. Bradshaw of Huddersfield—a daughter.

KELSEY.—On May 21, at Cheam, the wife of Captain H. M. Kelsey, R.A.M.C.—a daughter.

MACKENZIE.—On May 24, at Woking, the wife of Dr. Melville Douglas Mackenzie—a son.

PECK.—On May 22, at Chartham, near Canterbury, the wife of Dr. J. P. Saville Peck—a daughter.

PRYS-JONES.—On May 23, at the Denbighshire Infirmary, the wife of Dr. T. B. Prys-Jones—a daughter.

ROOKE.—On May 24, the wife of Dr. A. W. M. Rooke, of North Finchley—a daughter.

MARRIAGES

BARRINGTON-WARD—REUTER.—On May 22, in London, Sir Lancelot Barrington-Ward, F.R.C.S., to Miss C. W. Reuter.

EDWARDS—COX.—On May 3, at Camborne, John Anthony Clifford Edwards, F.R.C.S., of Westerham, to Stella Elizabeth Cox.

DEATHS

HARRIS.—On May 20, Herbert Elwin Harris, M.B. Camb., F.R.C.S., formerly of Clifton, Bristol, aged 80.

HENSHAW.—On May 22, at Derngate, Northampton, William Alfred Henshaw, M.R.C.S., aged 68.

MOORE.—On May 18, Cecil Frank Moore, M.B. Lond., formerly of Slough.

ROBINS.—On May 21, John Mannix Robins, F.R.C.S.E., of Colchester, aged 33.

ROWLAND.—On May 20, John Rowland, M.C., M.R.C.S., of Battersea Bridge Road, S.W.11, aged 49.